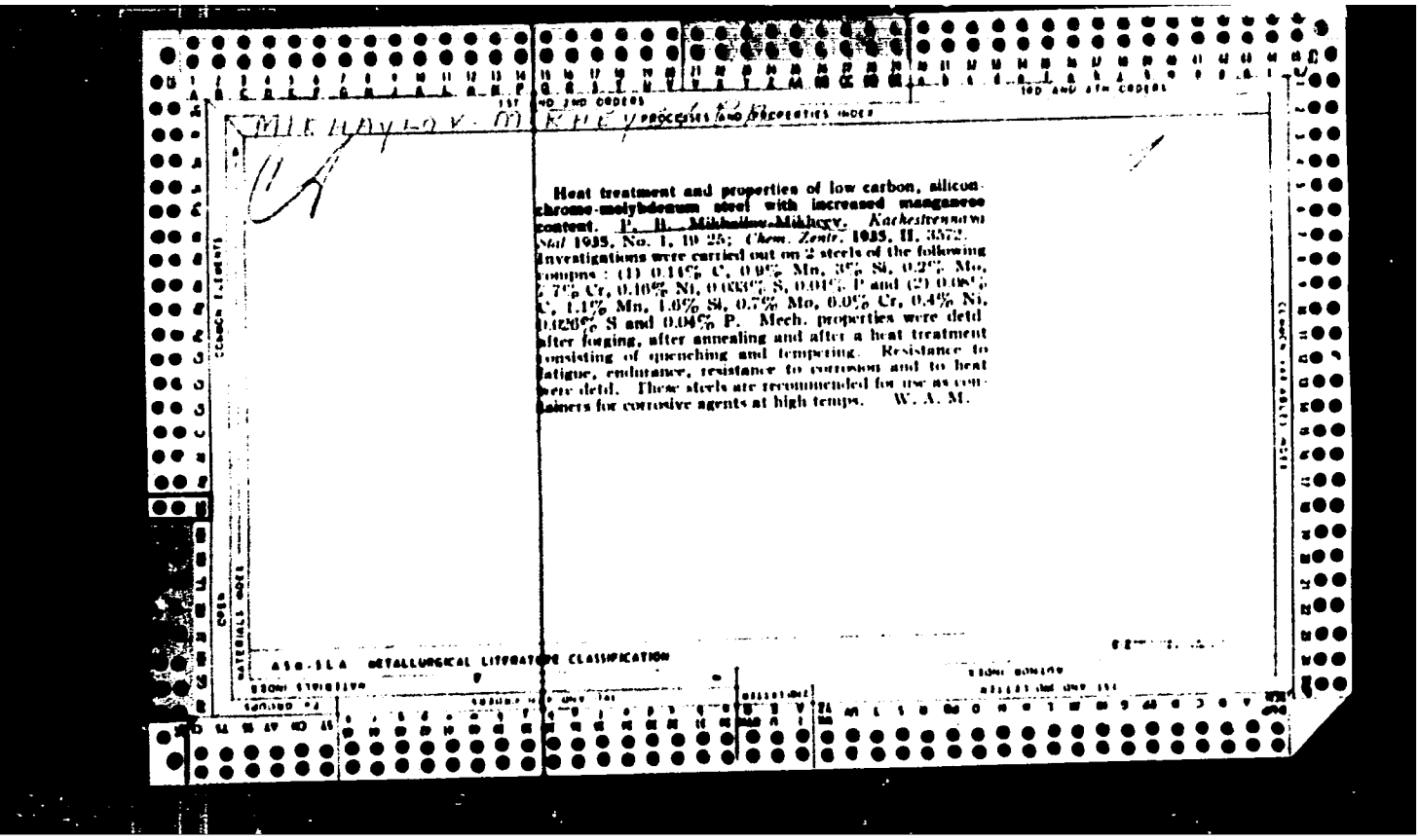
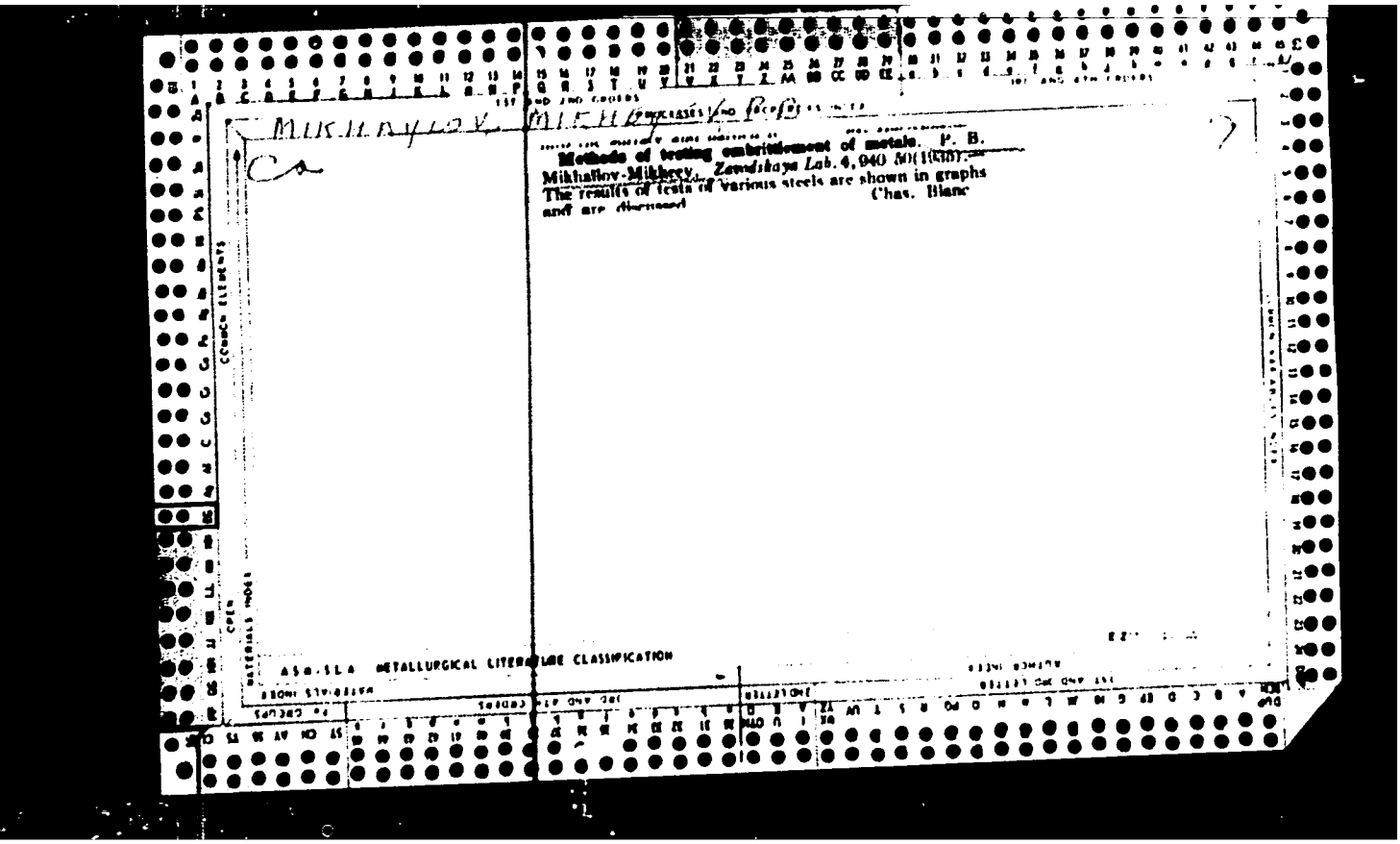
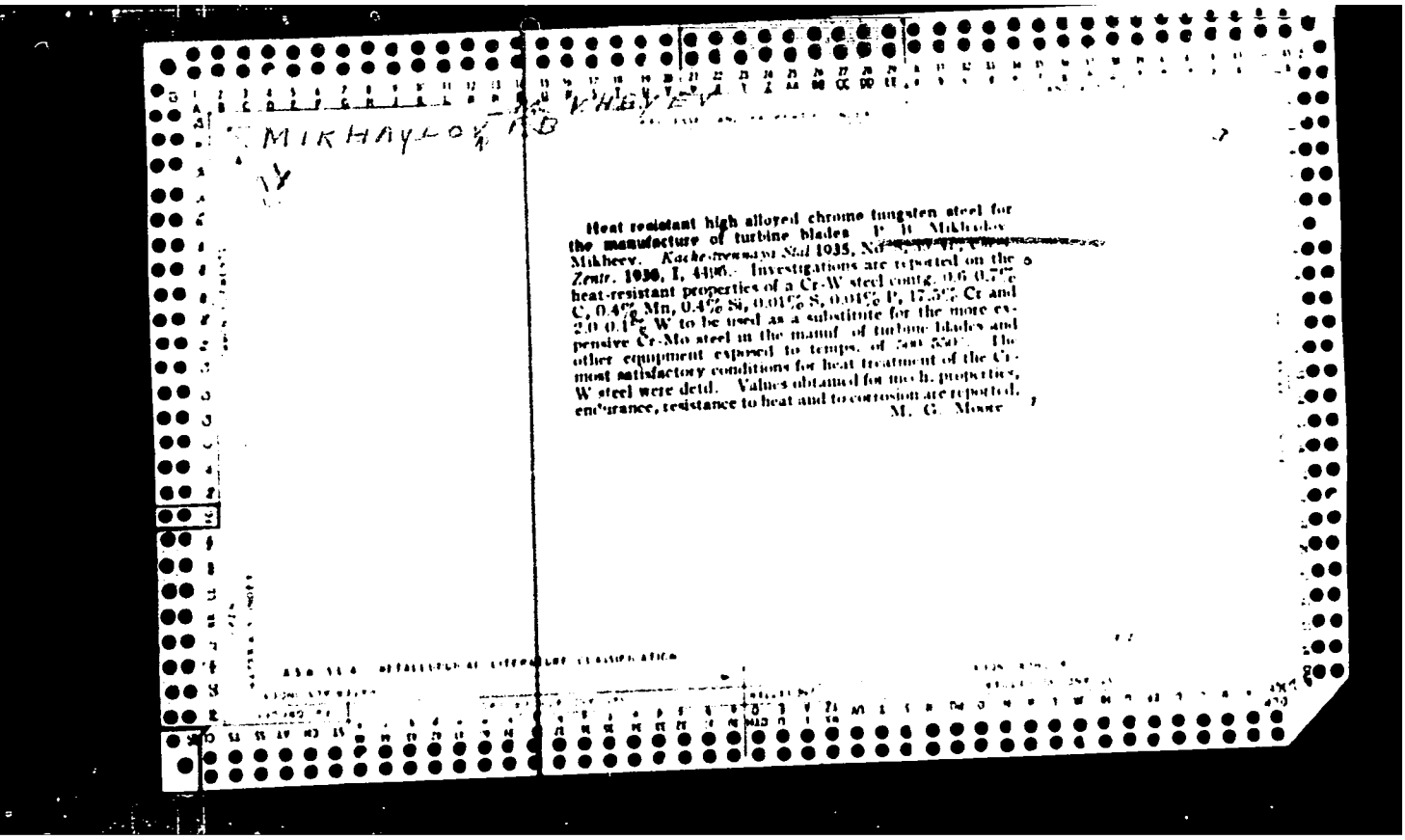


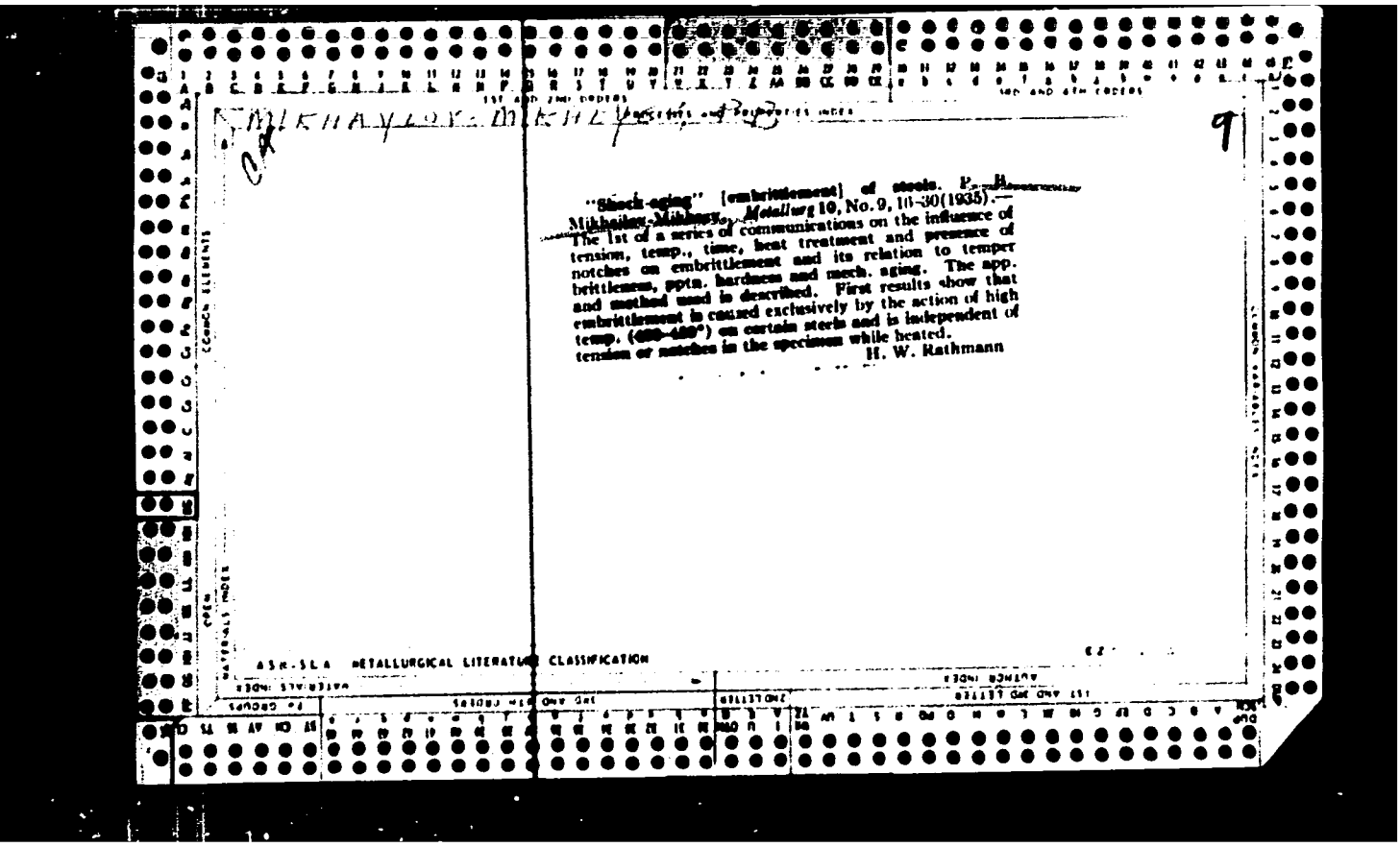
Heat treatment and properties of low carbon, silicon-chrome-molybdenum steel with increased manganese content. P. P. Mikhailov-Mikheev. *Kachestvennaya Stal* 1935, No. 1, 19-25; *Chem. Zentr.* 1935, II, 3572. Investigations were carried out on 2 steels of the following compns: (1) 0.14% C, 0.9% Mn, 3% Si, 0.2% Mo, 2.7% Cr, 0.10% Ni, 0.033% S, 0.01% P and (2) 0.08% C, 1.1% Mn, 1.0% Si, 0.7% Mo, 0.0% Cr, 0.4% Ni, 0.020% S and 0.04% P. Mech. properties were detd after forging, after annealing and after a heat treatment consisting of quenching and tempering. Resistance to fatigue, endurance, resistance to corrosion and to heat were detd. These steels are recommended for use as containers for corrosive agents at high temps. W. A. M.



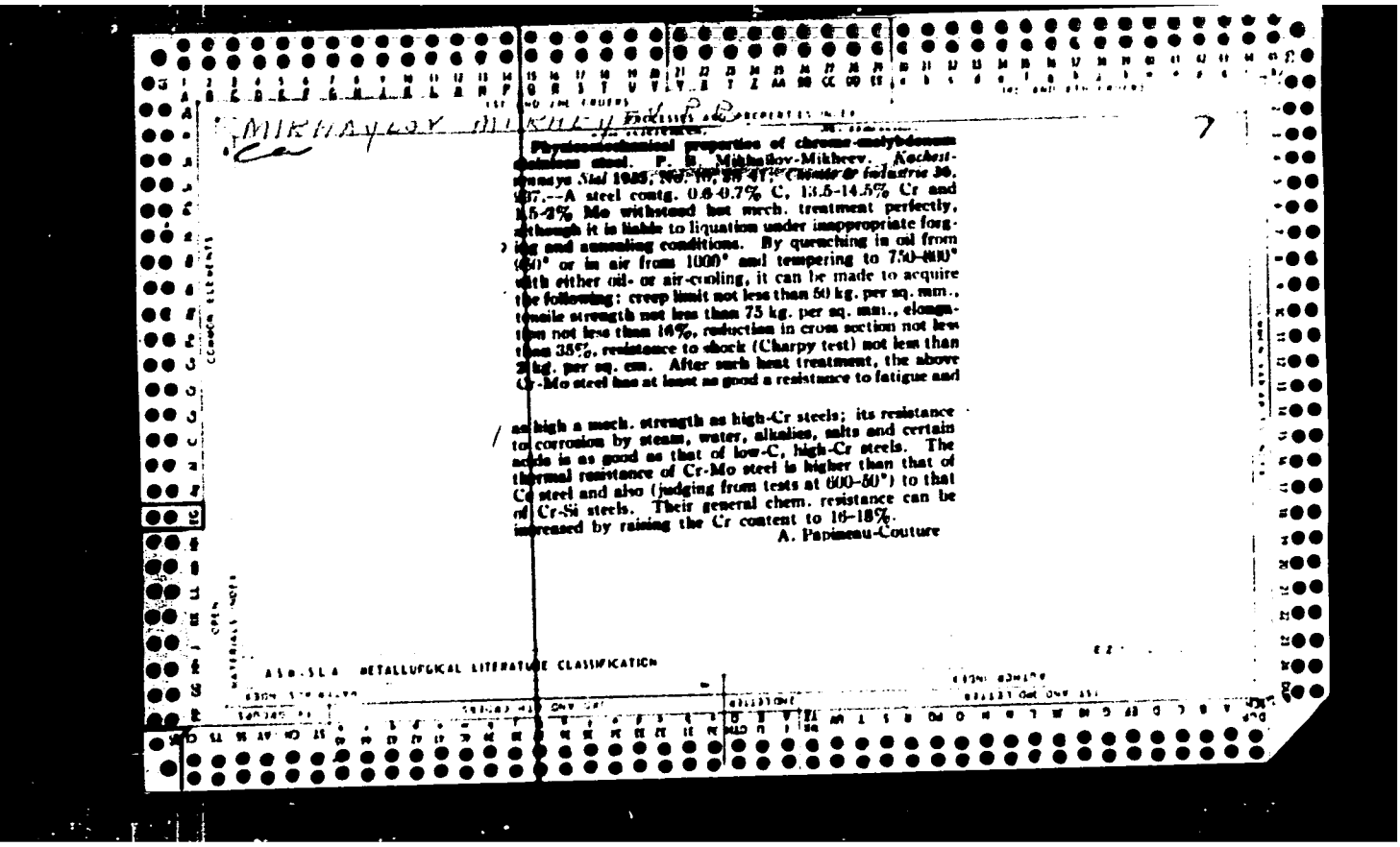


Heat resistant high alloyed chrome tungsten steel for the manufacture of turbine blades P. P. Mikhaylov, Mikheev. *Kachestvennaya Stal* 1935, No. [illegible]. *Zentr.* 1936, I, 4486.— Investigations are reported on the heat-resistant properties of a Cr-W steel containing 0.6-0.7% C, 0.4% Mn, 0.4% Si, 0.01% S, 0.01% P, 17.5% Cr and 2.0-0.1% W to be used as a substitute for the more expensive Cr-Mo steel in the manuf. of turbine blades and other equipment exposed to temps. of [illegible]. The most satisfactory conditions for heat treatment of the Cr-W steel were detd. Values obtained for mech. properties, endurance, resistance to heat and to corrosion are reported.

M. G. Moore



"Shock-aging" [embrittlement] of steels. P. B. Mikhailov-Mikhaev. *Metallurg* 10, No. 9, 10-30(1935).—The 1st of a series of communications on the influence of tension, temp., time, heat treatment and presence of notches on embrittlement and its relation to temper brittleness, ppta. hardness and mech. aging. The app. and method used is described. First results show that embrittlement is caused exclusively by the action of high temp. (400-480°) on certain steels and is independent of tension or notches in the specimens while heated.
H. W. Rathmann

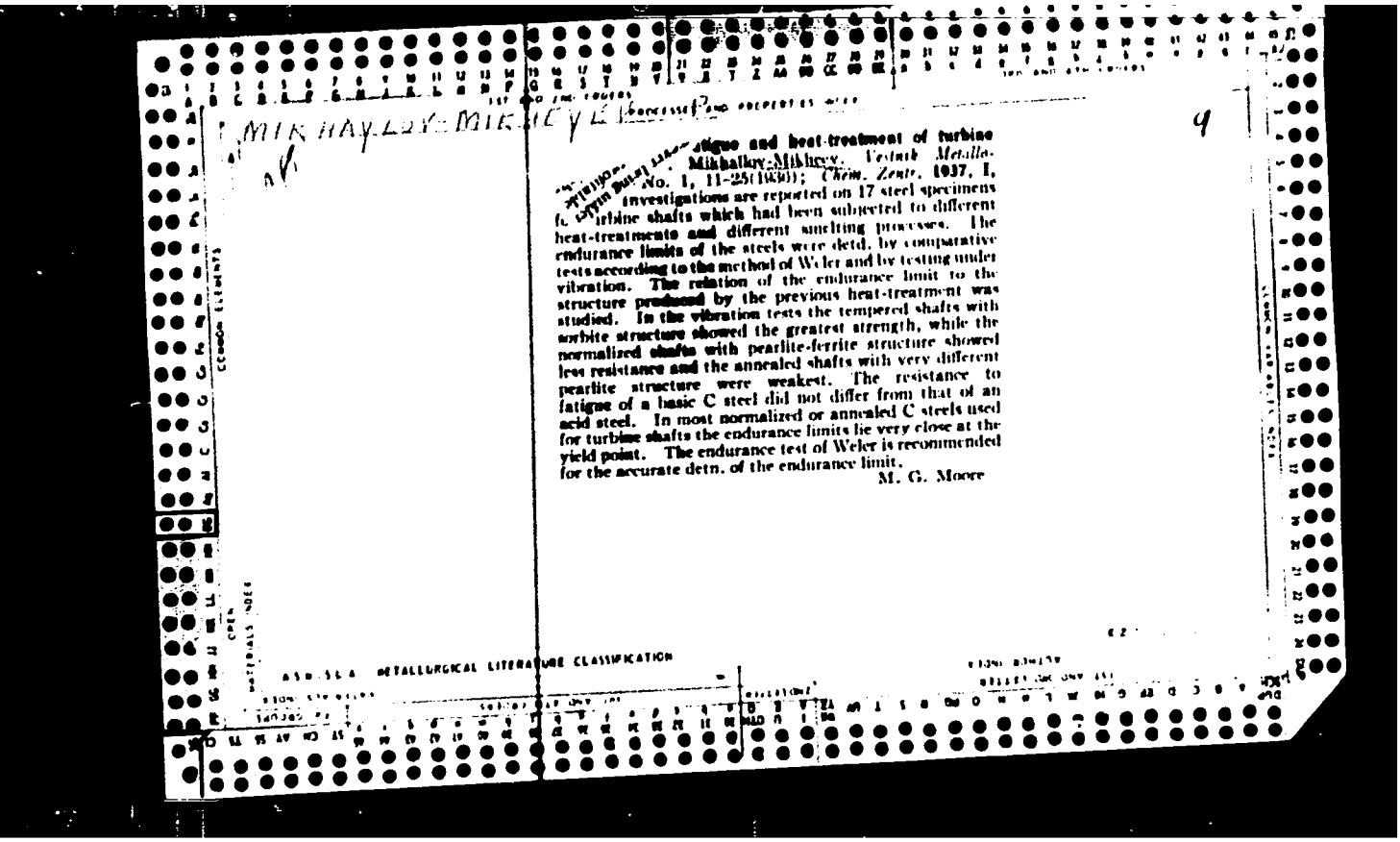


MIKHAYLOV-MIKHEEV, M. P.

Physicochemical properties of chrome-molybdenum stainless steel. P. P. Mikhailov-Mikheev. *Kachestvennaya Stal* 1935, No. 10, pp 41-[illegible]; *Chimie & Industrie* 36, 837.—A steel contg. 0.6-0.7% C, 13.5-14.5% Cr and 1.5-2% Mo withstood hot mech. treatment perfectly, although it is liable to liquation under inappropriate forging and annealing conditions. By quenching in oil from (illegible)° or in air from 1000° and tempering to 750-800° with either oil- or air-cooling, it can be made to acquire the following: creep limit not less than 50 kg. per sq. mm., tensile strength not less than 75 kg. per sq. mm., elongation not less than 16%, reduction in cross section not less than 38%, resistance to shock (Charpy test) not less than 2 kg. per sq. cm. After such heat treatment, the above Cr-Mo steel has at least as good a resistance to fatigue and as high a mech. strength as high-Cr steels; its resistance to corrosion by steam, water, alkalies, salts and certain acids is as good as that of low-C, high-Cr steels. The thermal resistance of Cr-Mo steel is higher than that of Cr steel and also (judging from tests at 600-50°) to that of Cr-Si steels. Their general chem. resistance can be increased by raising the Cr content to 16-18%.

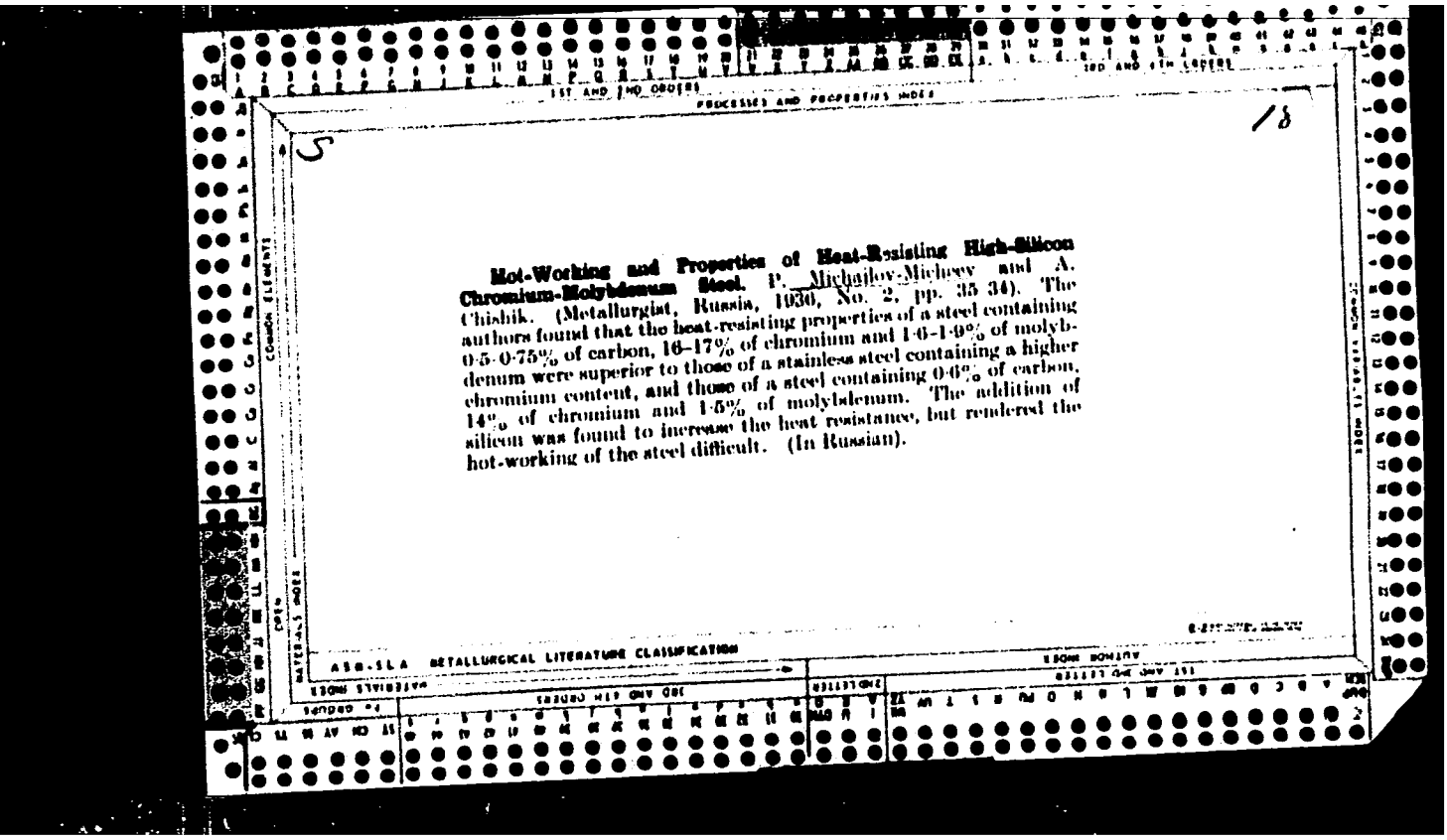
A. Papineau-Couture

A5a-5L4 METALLURGICAL LITERATURE CLASSIFICATION

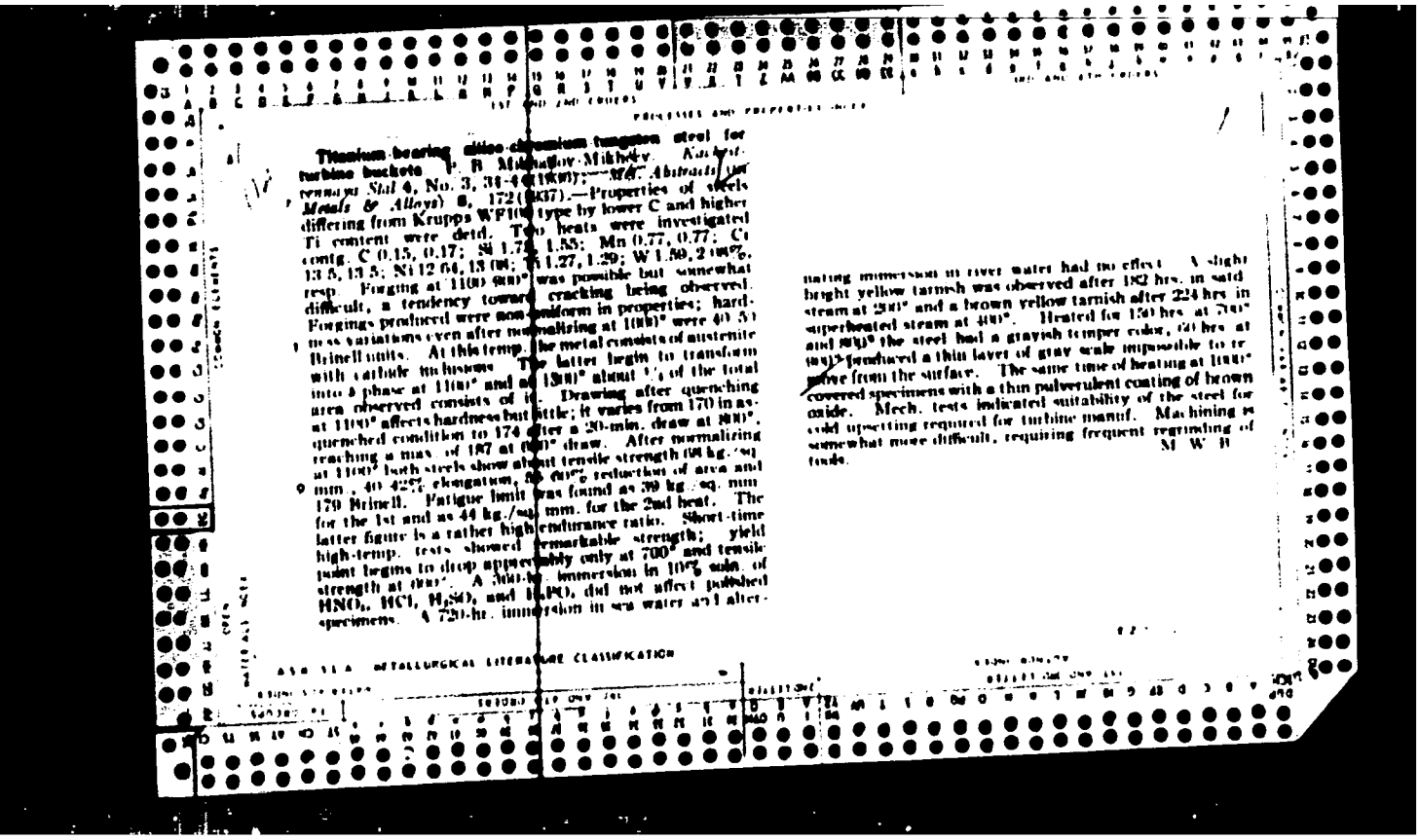


...tigue and heat-treatment of turbine ... Mikhailov-Mikheev. *Vestnik Metallo-* ... No. 1, 11-25(1936)); *Chem. Zentr.* 1937, I, ... investigations are reported on 17 steel specimens ... turbine shafts which had been subjected to different heat-treatments and different smelting processes. The endurance limits of the steels were detd. by comparative tests according to the method of Weler and by testing under vibration. The relation of the endurance limit to the structure produced by the previous heat-treatment was studied. In the vibration tests the tempered shafts with sorbite structure showed the greatest strength, while the normalized shafts with pearlite-ferrite structure showed less resistance and the annealed shafts with very different pearlite structure were weakest. The resistance to fatigue of a basic C steel did not differ from that of an acid steel. In most normalized or annealed C steels used for turbine shafts the endurance limits lie very close at the yield point. The endurance test of Weler is recommended for the accurate detn. of the endurance limit.

M. G. Moore



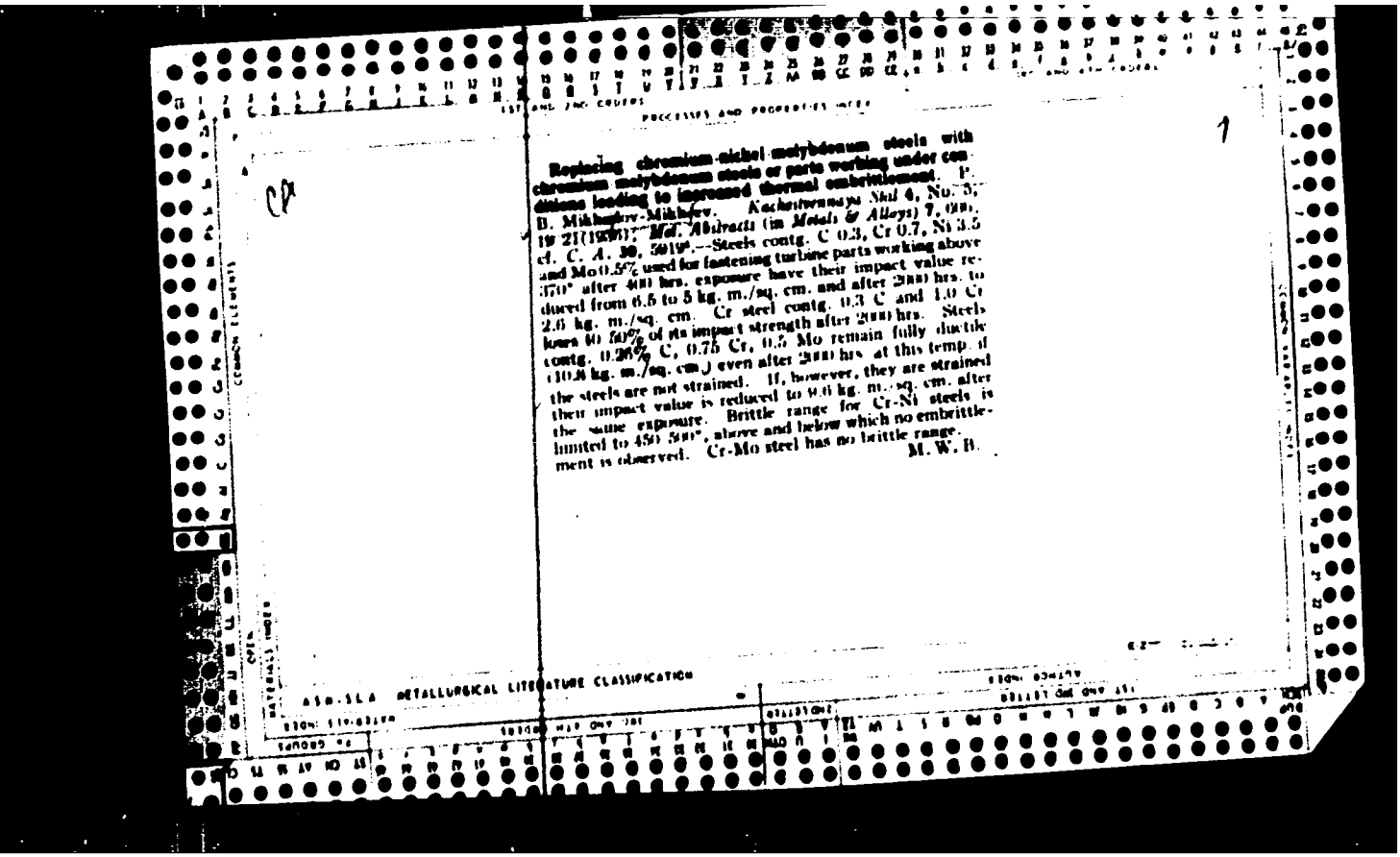
Hot-Working and Properties of Heat-Resisting High-Silicon Chromium-Molybdenum Steel. P. Michailov-Michevv and A. Chishik. (Metallurgist, Russia, 1930, No. 2, pp. 35–34). The authors found that the heat-resisting properties of a steel containing 0·5–0·75% of carbon, 16–17% of chromium and 1·6–1·9% of molybdenum were superior to those of a stainless steel containing a higher chromium content, and those of a steel containing 0·6% of carbon, 14% of chromium and 1·5% of molybdenum. The addition of silicon was found to increase the heat resistance, but rendered the hot-working of the steel difficult. (In Russian).



Titanium-bearing silico-chromium tungsten steel for turbine buckets. P. B. Mikheev-Mikhlev. *Kachestvennaya Stal* 4, No. 3, 31–4 (1936); —*Met. Abstracts* (*Metals & Alloys*) 8, 172 (1937).—Properties of steels differing from Krupps WF1[illegible] type by lower C and higher Ti content were detd. Two heats were investigated contg. C 0.15, 0.17; Si 1.75, 1.55; Mn 0.77, 0.77; Cr 13.5, 13.5; Ni 12.64, 13.00; Ti 1.27, 1.29; W 1.89, 2.00%, resp. Forging at 1100° was possible but somewhat difficult, a tendency toward cracking being observed. Forgings produced were non-uniform in properties; hardness variations even after normalizing at 1000° were 40–50 Brinell units. At this temp. the metal consists of austenite with carbide inclusions. The latter begin to transform into δ phase at 1100° and at 1300° about ½ of the total area observed consists of it. Drawing after quenching at 1100° affects hardness but little; it varies from 170 in as-quenched condition to 174 after a 20-min. draw at 300°, reaching a max. of 187 at 600° draw. After normalizing at 1100° both steels show about tensile strength 98 kg./sq. mm., 40–42% elongation, 55–60% reduction of area and 179 Brinell. Fatigue limit was found as 39 kg./sq. mm. for the 1st and as 44 kg./sq. mm. for the 2nd heat. The latter figure is a rather high endurance ratio. Short-time high-temp. tests showed remarkable strength; yield point begins to drop appreciably only at 700° and tensile strength at 800°. A 300-hr. immersion in 10% soln. of HNO_3, HCl, H_2SO_4, and NaOH, did not affect polished specimens. A 720-hr. immersion in sea water and after-

nating immersion in river water had no effect. A slight bright yellow tarnish was observed after 192 hrs. in sated steam at 200° and a brown yellow tarnish after 224 hrs in superheated steam at 400°. Heated for 150 hrs. at 700° and 800° the steel had a grayish temper color, 60 hrs at 900° produced a thin layer of gray scale impossible to remove from the surface. The same time of heating at 1000° covered specimens with a thin pulverulent coating of brown oxide. Mech. tests indicated suitability of the steel for cold upsetting required for turbine manuf. Machining is somewhat more difficult, requiring frequent regrinding of tools.

M. W. H.



Replacing chromium-nickel molybdenum steels with chromium molybdenum steels or parts working under conditions leading to increased thermal embrittlement. P. D. Mikhaylov-Mikhaylov. *Kachestvennaya Stal* 4, No. 5, 19-21(1939). *Met. Abstracts* (in *Metals & Alloys*) 7, 080, cf. *C. A.* 30, 5019⁹.—Steels contg. C 0.3, Cr 0.7, Ni 3.5 and Mo 0.5% used for fastening turbine parts working above 570° after 400 hrs. exposure have their impact value reduced from 6.5 to 5 kg. m./sq. cm. and after 2000 hrs. to 2.6 kg. m./sq. cm. Cr steel contg. 0.3 C and 1.0 Cr loses 60 to 70% of its impact strength after 2000 hrs. Steels contg. 0.20% C, 0.75 Cr, 0.5 Mo remain fully ductile (10.8 kg. m./sq. cm.) even after 2000 hrs at this temp. if the steels are not strained. If, however, they are strained their impact value is reduced to 9.6 kg. m./sq. cm. after the same exposure. Brittle range for Cr-Ni steels is limited to 450-500°, above and below which no embrittlement is observed. Cr-Mo steel has no brittle range.
M. W. B.

[redacted]

1ST AND 2ND ORDERS

3RD AND 4TH ORDERS

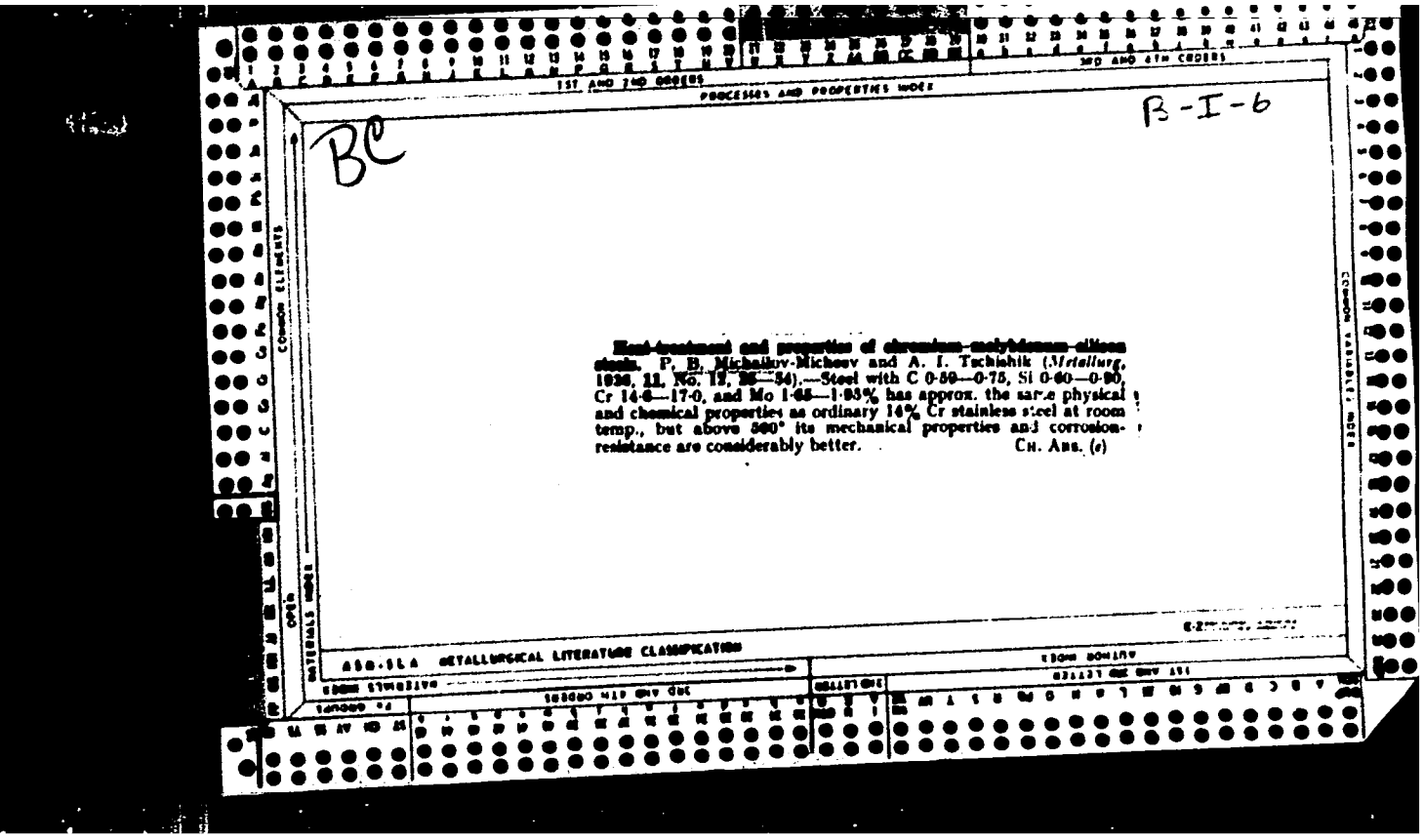
PROCESSES AND PROPERTIES INDEX

BC

B-I-4

Isothermic method of carrying out creep tests over long periods of time. F. R. Mikhailov-Mikheev and G. M. Dumnov (Zavod. Lab., 1936, 5, [illegible]).—Apparatus is described. R. T.

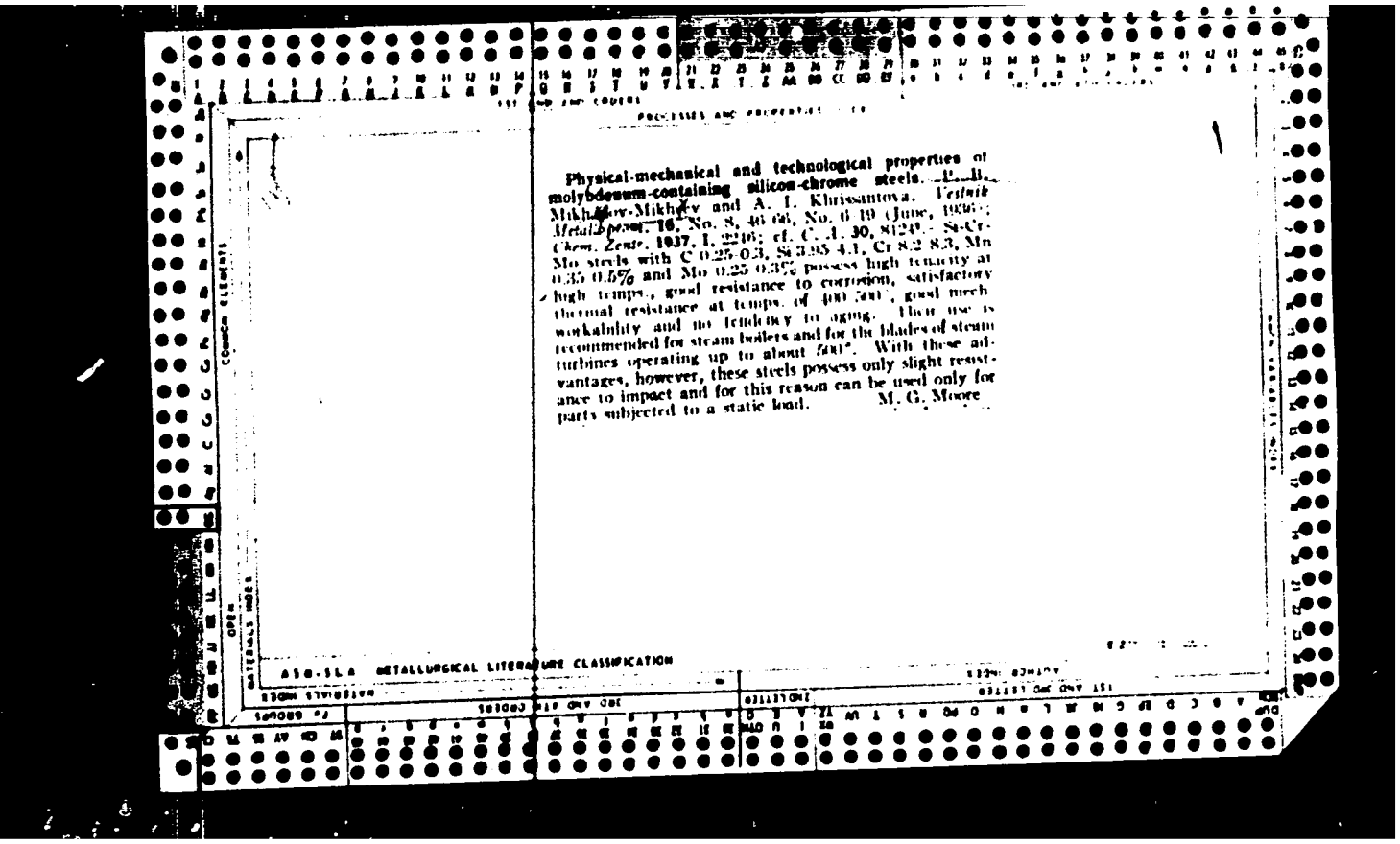
ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION



BC

B-I-6

Heat-treatment and properties of chromium-molybdenum-silicon steels. P. B. Michailov-Micheev and A. I. Tschishik (*Metallurg*, 1936, 11, No. 12, 25—34).—Steel with C 0·50—0·75, Si 0·60—0·90, Cr 14·6—17·0, and Mo 1·65—1·93% has approx. the same physical and chemical properties as ordinary 14% Cr stainless steel at room temp., but above 500° its mechanical properties and corrosion-resistance are considerably better. CH. ABS. (*e*)



Physical-mechanical and technological properties of molybdenum-containing silicon-chrome steels. P. P. Mikhalev-Mikhaev and A. I. Khrissantova. *Vestnik Metallopromyshlennosti*, **16**, No. 8, 40-66; No. 9-10 (June, 1936); *Chem. Zentr.*, **1937**, I, 2246; cf. C. A. **30**, 8124. Si-Cr-Mo steels with C 0.25-0.3, Si 3.95-4.1, Cr 8.2-8.3, Mn 0.35-0.5% and Mo 0.25-0.3% possess high tenacity at high temps., good resistance to corrosion, satisfactory thermal resistance at temps. of 400-500°, good mechanical workability and no tendency to aging. Their use is recommended for steam boilers and for the blades of steam turbines operating up to about 500°. With these advantages, however, these steels possess only slight resistance to impact and for this reason can be used only for parts subjected to a static load. M. G. Moore

Copper steel. Leningrad, Gos. nauchno-tekhn. izd-vo lit-ry p chernoi i tsvetnoi metallurgii, 1941. (Mic 53-162)
Collation of the original as determined from the film: 231 p.

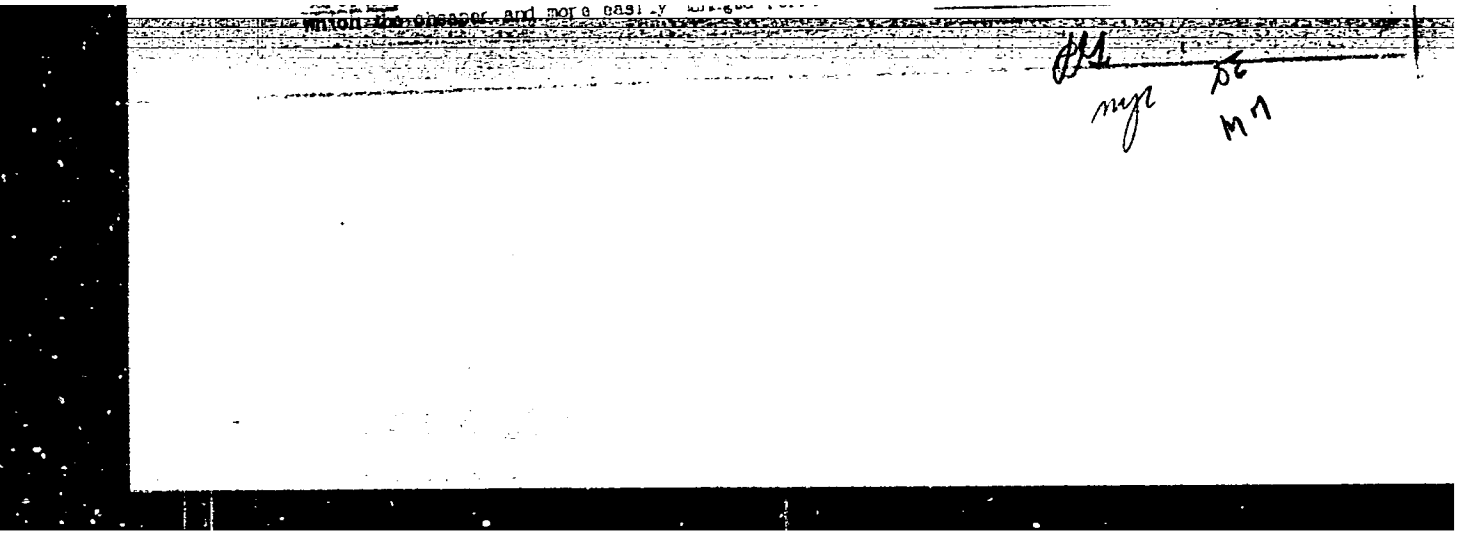
Microfilm TN-6

MIKHAYLOV-MIKHAYEV, Prokopiy Borisovich, doktor tekhnicheskikh nauk; MES'KIN, V.S., doktor tekhnicheskikh nauk, retsenzent; VYAZNIKOV, N.F., kandidat tekhnicheskikh nauk, redaktor; VASIL'YEVA, V.P., redaktor izdatel'stva; POL'SKAYA, R.G., tekhnicheskiy redaktor; SYCHEVA, O.V., tekhnicheskiy redaktor

[Thermal brittleness of steel] Teplovaia khrupkost' stali. Moskva, Gos. nauchno-tekhn. izd-vo mashinostroit. lit-ry, 1956. 114 p. (Steel--Brittleness) (MLRA 9:10)

MIKHAYLOV-MIKHEEV, P.B.

3532. MODERN TRENDS IN THE DEVELOPMENT AND USE OF HEAT RESISTING MATERIALS IN TURBINE CONSTRUCTION. Mikhaylov-Mikheev, P.B. Teploenergetika (Heat Pwr Engng, Moscow), Dec. 1956, 3-10). Data on heat-resisting properties are given and an analysis is made of the advantages of austenitic and ferritic steels used in the manufacture of steam and gas [illegible] the temperature range in



Category : USSR/Solid State Physics - Mechanical properties of crystals and poly- E-9
crystalline compounds

Abs Jour : Ref Zhur - Fizika, No 1, 1957 No 1369

Author : Mikhaylov-Mikheyev, P.B.
Title : On the Thermal and Tempering Brittleness of Ferrite (Pearlite) Steel

Orig Pub : Metallovedeniye i obrabotka metallov, 1956, No 2, 23-33

Abstract : Based on data in the literature and on his own experiments, the author proposes that the thermal and tempering brittleness are identical in nature and their development is determined by the same factors, namely temperature and time. This type of brittleness is merely one of the manifestations of cold-shortness, observed in all ferrite steels under impact tests at low temperatures. Under the influence of the processes that cause thermal and tempering brittleness, the impact viscosity vs. temperature test curves shift towards higher temperatures, and this causes the brittle state to start manifesting itself at room temperatures. There is some doubt as to whether thermal brittleness is caused by the separation of finely-dispersed grains of the new phase. It is more probable that the thermal brittleness is rpoduced by segregation of atoms of individual elements of the solid solution towards the grain boundaries without the separation of individual crystalline phases. Bibliography, 18 titles.

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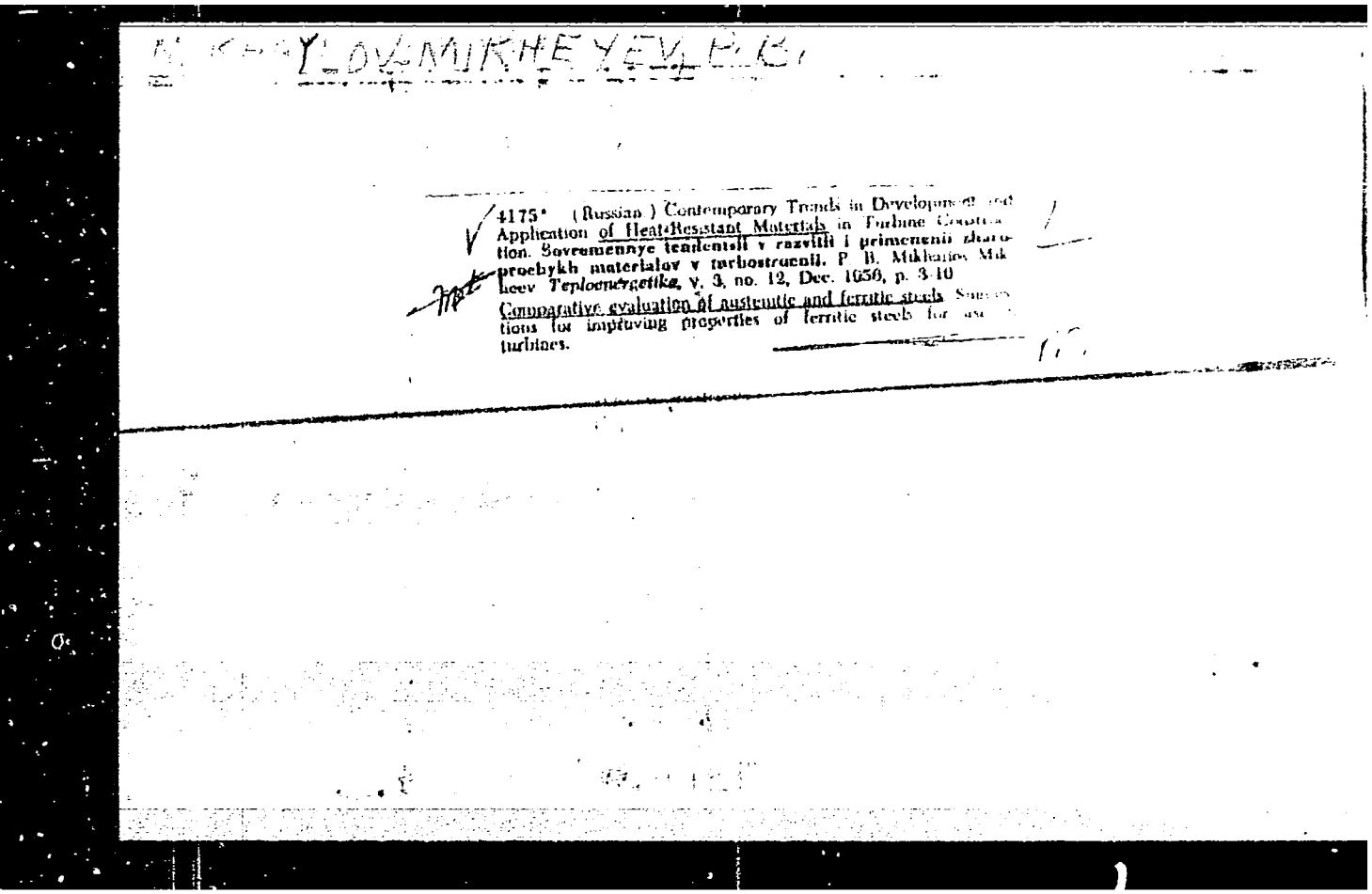

4175* (Russian) Contemporary Trends in Development and Application of Heat-Resistant Materials in Turbine Construction. **Sovremennye tendentsii v razvitii i primenenii zharoprochnykh materialov v turbostroenii.** P. B. Mikhaylov, M. M. Mikheev *Teploenergetika*, v. 3, no. 12, Dec. 1956, p. 3-10

Comparative evaluation of austenitic and ferritic steels. Suggestions for improving properties of ferritic steels for use in turbines.

MIKHAYLOV-MIKHEYEV, P.B.

Evaluating steel sensitiveness to temper and thermal brittleness.
Zav. lab.22 no.7:849-853 '56. (MLRA 9:12)

1. Kovskiy mashinostroitel'nyy zavod imeni V.I.Lenina.
(Steel--Testing)

MIKHAYLOV-MIKHEYEV, P.B., doktor tekhnicheskikh nauk.

Titanium and its alloys; survey of technical periodicals.
Vest. mash. 36 no.9:70-73 S '56. (MLRA 9:10)

(Titanium alloys--Metallurgy)

YEVANGULOVA, Yevgeniya Pavlovna; FOGEL', A.A., kandidat tekhnicheskikh nauk, redaktor; SPITSYN, M.A., kandidat tekhnicheskikh nauk, redaktor; SLUKHOTSKIY, A.Ye., kandidat tekhnicheskikh nauk, redaktor; GLUKHANOV, N.P., kandidat tekhnicheskikh nauk, redaktor; BAMUNER, A.V., inzhener, redaktor; SIMONOVSKIY, N.Z., redaktor izdatel'stva; MIKHAYLOV-MIKHEYEV, P.B., doktor tekhnicheskikh nauk, retsenzent; SYCHEVA, O.V., tekhnicheskiy redaktor.

[Quality control of surface hardening] Kontrol' kachestva poverkhnostnoi zakalki, Izd. 2-oe, ispr. i dop. Pod.red. A.A. Fogelia. Moskva, Gos.nauchno-tekhn.izd-vo mashinostroit. lit-ry, 1957. 33 p.(Bibliotechka vysokochastotnika-termista, no5] (MLRA 10:6)

(Metals--Hardening) (Quality control)

PHASE I BOOK EXPLOITATION 1152

Mikhaylov-Mikheyev, Prokopiy Borisovich, Doctor of Technical Sciences

Novyy promyshlennyy metall - titan (A New Industrial Metal, Titanium) Moscow, Mashgiz, 1958. 32 p. 5,500 copies printed.

Reviewer: Vyaznikov, N.F., Candidate of Technical Sciences; Ed.: Chechulin, B.B., Engineer; Ed. of Publishing House: Simonovskiy, N.Z.; Tech. Ed.: Sokolova, L.V.; Managing Ed. for Literature on the Design and Operation of Machinery (Leningrad Division, Mashgiz): Fetisov, F.I., Engineer.

PURPOSE: This booklet is intended to acquaint engineers and technicians in the machine-building industry with the properties of titanium, methods of extracting it, and the technology of processing it.

COVERAGE: The booklet deals with the physical and chemical properties of titanium, methods of extracting it from ores, alloying of titanium with other elements, methods of strengthening titanium, mechanical properties of the metal at ordinary and elevated temperatures, industrial processing of titanium articles, safety techniques, and applications and production costs of titanium.

Card 1/3

A New Industrial Metal, Titanium 1152

No personalities are mentioned. There are 13 references, of which 9 are Soviet, 3 English, and 1 German.

TABLE OF CONTENTS:

Card 2/3

AVAILABLE: Library of Congress

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Card 3/3

37(2) PHASE I BOOK EXPLOITATION SOV/1411

Mikhaylov-Mikheyev, Prokopiy Borisovich, Doctor of Technical Sciences

Metall gazovykh turbin (Metal for Gas Turbines) Moscow, Mashgiz, 1958. 351 p. 5,000 copies printed.

Reviewer: Bolkhovitinov, N.F., Doctor of Technical Sciences, Professor; Ed.: Vyaznikov, N.F., Candidate of Technical Sciences; Ed. of Publishing House: Vasil'yeva, V.P.; Tech. Ed.: Speranskaya, O.V.; Managing Ed. for Literature on the Design and Operation of Machinery (Leningrad Division, Mashgiz): Fetisov, F.I., Engineer.

PURPOSE: This book is intended for engineers working in the fields of design, manufacture, and operation of gas turbines, and for metallurgists and manufacturers of heat-resistant materials. It may also be useful for students of related specialized courses at advanced technical schools.

COVERAGE: The book describes the present state of the problems of heat-resistant materials for gas turbines, on the basis of a systematic analysis of data published in the technical literature during the last ten years. Along with

Card 1/9

a consideration of the properties required of metals, their service conditions, and the metallurgical characteristics necessary in the manufacture of turbine components, the book discusses the basic theoretical laws of heat resistance and the alloying of heat-resistant materials. Detailed characteristics of the resistant properties of a large number of industrial types of alloys used in domestic and foreign gas-turbine construction are given. There are 271 references, 80 of which are Soviet (3 translations from English), 165 English, 23 German, and 3 French.

TABLE OF CONTENTS:

GOLOVIN, Georgiy Fedorovich; ZAMYATNIN, Mikhail Mikhaylovich; LEVIN, Ye.Ye., kand.tekhn.nauk, retsenzent; MIKHAYLOV-MIKHEYEV, P.B., doktor tekhn.nauk, red.; VASIL'YEVA, V.P., red.izd-va; POL'SKAYA, R.G., tekhn.red.

[High-frequency heat treatment; metals and the technology of heat treatment] Vysokochastotnaia termicheskaia obrabotka; voprosy metallovedeniia i tekhnologii. Moskva, Gos.nauchno-tekhn.izd-vo mashinostroit.lit-ry, 1959. 185 p. (MIRA 12:5)
(Steel--Heat treatment) (Induction heating)

SOV/96-59-10-1/22

AUTHOR: Mikhaylov-Mikheyev, P.B. (Dr. Tech. Sci.)

TITLE: Metallurgical Advances in Heat-resisting Steels and Alloys for Gas-turbine Construction

PERIODICAL: Teploenergetika, 1959, Nr 10, pp 3-8 (USSR)

ABSTRACT: This article gives a general review of heat-resistant steels and alloys, both Soviet and foreign. Two different sets of problems are posed in the development of steels for aviation and industrial gas-turbines. For any given mechanical stress the operating temperature depends on the service life required. This is one of the main reasons why gas turbines for a life of 100 000 hours cannot yet use temperatures higher than 800-815 °C, whilst turbines for transport, with lives of 1000 to 5000 hours, can use gas temperatures of 900-925 °C. The development of heat-resistant alloys for very long service in industrial gas-turbines presents special difficulties which have not yet been fully overcome. The present state of development of heat-resistant steels and alloys may be judged from the graphs given in Fig 1. They show temperature against stress for a life of 1000 hours for a number of different types of steel. It will be noted that the temperature

Card 1/8

Metallurgical Advances in Heat-resisting Steels and Alloys for Gas-turbine Construction

range of 500-600 °C, which until recently required the use of high-alloy austenitic steels, can now be covered by cheap low- and medium-alloy steels of the pearlitic and martensitic classes. Tests of ultimate strength at 10^5 hours showed that the best modern pearlitic steel, such as grades EI415 and R2, can be operated for long periods at 550 °C at a stress of 15-18 kg/mm^2 for steel EI415 and 12-14 kg/mm^2 for steel R2. Pearlitic steels to withstand even higher temperatures are being developed in the Soviet Union; for example, steels P1 and P3 can be operated at stresses of 9 and 8 kg/mm^2 respectively at a temperature of 600 °C. A number of grades of stainless steel containing 12% chromium are of interest for use in the temperature range of 550-600 °C. They have better resistance to corrosion than pearlitic steel. Steels which are also alloyed with niobium, such as grades 18Kh11MFB and 18Kh11MVFB and the British grades N.46 and Rex 448, can be used at stresses of 10-12 kg/mm^2, at 600 °C. A brief discussion then follows of multi-alloyed austenitic steels. For instance, steel EI726 containing 19% Ni, 2.5% W, 1.1% Mo and 0.025% B have greater long-term

Card 2/8

Metallurgical Advances in Heat-resisting Steels and Alloys for Gas-turbine Construction

strength at 650 and 700 °C than such steels as EI434 or G18B, which are widely used for gas turbines. Successful austenitic casting steels have also been developed, such as TsZh6, suitable for a stress of 8 kg/mm^2 at 750 °C, and TsZh8, suitable for a stress of 8.5 kg/mm^2 at a temperature of 700 °C. Nickel steels are then discussed. Depending on the working stress, nickel steels can be used at temperatures up to 800-850 °C or even higher if the life is short. There are a number of nickel alloys such as the British alloy Nimonic 100, the American alloy Inconel 700 and Soviet grades EI826 and EI827, for which the ultimate strength at 100 hours and a temperature of 815-850 °C reaches 30 - 25 kg/mm^2; and at 870-900 °C, 20 - 15 kg/mm^2. Still better nickel alloys exist such as Soviet grades VZh36-300, ZhS6, ZhS6K, and EI857, whose ultimate strength at 100 hours is greater than 20 kg/mm^2 at 900 °C and 10 kg/mm^2 at 950-1000 °C. The most heat-resistant of modern special alloys, at any rate for short service life, are those based on cobalt. They are not so good as nickel alloys in the temperature

Metallurgical Advances in Heat-resisting Steels and Alloys for Gas-turbine Construction

range 700-800 °C but have appreciably better long-term strength up to 900-950 °C. The Soviet nickel alloys VZh36-300, ZhS6 and ZhS6K not only have better performance at 900-950 °C than foreign nickel alloys such as Nimonic 100, Inconel 700 and GMR-235, but are also better than such heat-resistant alloys as the American cobalt alloy grade X-40. Increasing knowledge of the theory of multi-component metallic systems has resulted in the development of a series of high-temperature alloys containing little or no molybdenum, cobalt or niobium; for example, Soviet grade EI726 contains no molybdenum. An important feature in the development of new heat-resistant steels has been the use of new methods of production, such as melting in vacuo or neutral atmosphere, and the use of pure metals for alloying. Improved methods of hot working offer the possibility of further advance. For example, a gas-turbine rotor weighing 22 tons has been forged by the Novo-Kramatorsky works from an ingot weighing 38 tons of steel grade EI802. Discs and forgings have also been made of steels EI612 and EI765. Contemporary theory of heat-resistant alloys is based on empirical relationships

between the heat resistance and structure of the alloys. The basic principle is the correct distribution of alloying elements between the two main structures, solid solution and secondary phase. Multi-component systems that contain elements for raising the recrystallization temperature of the solid solution and elements that promote the formation of relatively infusible secondary phases have the best creep strength. The use of a number of components in high-alloy steels is particularly important. Various classes of steel are then considered, starting with pearlitic steels. The alloying effect of different elements is discussed with reference to Fig 2, taken from a paper by Austin, John and Lindsey. Pearlitic steels of the maximum heat-resistance are obtained if molybdenum, tungsten and chromium are all in solid solution with iron so that their carbides are formed. The influence of vanadium is examined with reference to the curves of Fig 3, taken from a paper by Kolbeck and Wright. The effects of heat treatment on steels of this class are discussed. When appropriately heat-treated, one of the most heat-resistant pearlitic steels is

Metallurgical Advances in Heat-resisting Steels and Alloys for Gas-turbine Construction

grade EI415. It has the micro-structure illustrated in Fig 4, which is taken from a paper by Kolbeck and Wright. Steels containing 12% chromium are then discussed. The influence of chromium content on creep strength is examined with reference to the graph of Fig 5 taken from a paper by Kolbeck and Wright. Austenitic steels and alloys are then discussed. Brief mention is made of a number of alloying elements such as nickel, cobalt, chromium and also molybdenum, tungsten, niobium, titanium and aluminium. These elements raise the recrystallization temperature of the solid solution and strengthen the inter-atomic links in the crystal lattice of austenite. They form the basis of a considerable number of austenitic heat-resistant alloys, such as steels EI726, G18B, Haines 88 and various cobalt alloys. The micro-structure of these alloys is briefly discussed, with reference to Fig 6 taken from a paper by Harris and Bailey. The heat resistance of austenitic steels and alloys can be improved by altering the nature and composition of the secondary phase. Alloys of the Nimonic type have very good mechanical properties at operational temperatures

Metallurgical Advances in Heat-resisting Steels and Alloys for Gas-turbine Construction

because of structural conversions. The latter are associated with separation from the main solid solution of finely dispersed inclusions of a strong secondary phase, the dimensions and distribution of which depend on the heat-treatment conditions. For example, Fig 7 shows the micro-structure of alloy KhN80T which has been aged under conditions promoting coagulation of separated particles of the γ' phase. This sample was aged for 200 hours at 850 °C. Modern disperse-solid steels and alloys of the austenitic class are highly alloyed, which facilitates the formation of excess phases of complex structure and high strength. Typical steels of this kind are disc alloy, and nickel alloys of type EI437 and EI727, which have great creep strength and considerable resistance to elastic and small plastic strains. For example, the mean yield point of austenitic steels of the disc alloy type is 65 kg/mm^2 and remains unaltered at temperatures up to 650 °C. Materials are already available for the manufacture of gas turbines operating for a long time at 800 °C or for much shorter times at 900-1000 °C.

SOV/96-59-10-1/22

Metallurgical Advances in Heat-resisting Steels and Alloys for Gas-turbine Construction

Developments towards still higher operating temperatures will require the use of alloys based on metals of higher melting point than iron, nickel and cobalt or will require the use of powder metallurgy. Both lines of development are likely to be important for gas-turbine manufacture. However, a great deal of research and development will be required before ceramic and metal-ceramic alloys produced by new methods are widely used particularly in industrial gas turbines.

Card 8/8

There are 7 figures and 14 references, of which 12 are Soviet and 2 English.

ASSOCIATION: Nevskiy mashinostroitel'nyy zavod
(Neva Building Works)

VYAZNIKOV, Nikolay Filippovich; YERMAKOV, Sergey Stepanovich; MIKHAYLOV-MIKHMYEV, P.B., prof., retsenzent; KORYUKOV, M.I., dotsent, kand.tekhn.nauk, red.; CHFAS, M.A., red.izd-va; KOMTOROVICH, A.I., tekhn.red.

[Use of powder metallurgy products in industry] Primenenie izdelii poroshkovoi metallurgii v promyshlennosti. Moskva, Gos.nauchno-tekhn.izd-vo mashinostroit.lit-ry, 1960. 187 p. (MIRA 13:6)
(Powder metallurgy)

PHASE I BOOK EXPLOITATION SOV/5798

Mikhaylov-Mikheyev, Prokopiy Borisovich, Doctor of Technical Sciences

Spravochnik po metallicheskim materialam turbino- i motorostroyeniya (Handbook on Metals for Turbine and Engine Construction) Moscow, Mashgiz, 1961. 838 p. Errata slip inserted. 13,000 copies printed.

Reviewer: V. I. Prosvirin, Professor, Doctor of Technical Sciences; Ed.: Ye. Ye. Levin, Candidate of Technical Sciences; Eds. of Publishing House: V. P. Vasil'yeva and G. A. Mitarchuk; Tech. Ed.: M. M. Peterson; Managing Ed. for Literature on the Design and Operation of Machines, Leningrad Department, Mashgiz: F. I. Fetisov, Engineer.

PURPOSE: This handbook is intended for technical personnel engaged in the design, manufacture, and handling of power-engineering equipment of various types and purposes.

COVERAGE: The handbook contains physicomechanical characteristics of metals and alloys employed in the manufacture of power-engineering machinery such as internal combustion engines, compressors, turbocom-

Card 1/[illegible]2

pressors, and steam and gas turbines for various purposes. Metals described in the handbook are appraised according to their appearance in semifinished products, their mechanical properties at room or elevated temperatures, their endurance, creep resistance, scale resistance, and stability at high temperatures, and according to their physical and manufacturing properties. The handbook also contains graphs and tables indicating the effect of constructional, engineering, and operational factors on the strength of metals and alloys. No personalities are mentioned. There are 131 references: 127 Soviet and 4 English.

TABLE OF CONTENTS [Abridged]:

KEYLIN, Grigoriy Samuilovich; LOZOVSKIY, Vladimir L'vovich; SITNIKOVA, Tamara Aleksandrovna; MIKHAYLOV-MIKHEYEV, P.B., red.; TELYASHOV, R.Kh., red.izd-va; GVIRIS, V.L., tekhn. red.

[Effect of heat treatment of the properties of chromium stainless steels; from practices at the "Krasnogvardeets" Plant] Vliianie termicheskoi obrabotki na svoistva khromistykh nerzhaveiushchikh stalei; opyt zavoda "Krasnogvardeets." Leningrad, 1963. 17 p. (Leningradskii dom nauchno-tekhnicheskoi propagandy. Seriia: Metallovedenie i termicheskaia obrabotka, no.1) (MIRA 16:8)

(Steel, Stainless--Heat treatment)

SHEKALOV, Aleksandr Alekseyevich, kand. tekhn. nauk; MIKHAYLOV-MIKHEYEV, P.B., red.; SHILLING, V.A., red.izd-va; GVIRTS, V.L., tekhn.red.

[New alloys for cast permanent magnets] Novye splavy dlia litykh postoiannykh magnitov. Leningrad, 1963. 17 p. (Leningradskii dom nauchno-tekhnicheskoi propagandy. Obmen peredovym opytom. Seriia: Metallovedenie i termicheskaia obrabotka, no.3) (MIRA 16:11)
(Alloys) (Magnets)

VYAZNIKOV, Nikolay Filippovich, kand. tekhn. nauk; POPANDOPULO, A.N., kand. tekhn. nauk; MIKHAYLOV-MIKHEYEV, P.B., red.; SHILLING, V.A., red.izd-va; GVIRTS, V.L., tekhn. red.

[Modern high-speed steel and its heat treatment] Sovremennaia bystrorezhushchaia stal' i ee termicheskaia obrabotka. Leningrad, 1963. 21 p. (Leningradskiy dom nauchno-tekhnicheskoi propagandy. Obmen peredovym opytom. Seriia: Metallovedenie i termicheskaia obrabotka, no.5)
(MIRA 16:12)

(Tool steel—Heat treatment)

LEVIN, Yevgeniy Yefimovich, kand. tekhn.nauk; PIVNIK, Yelena Markovna, kand. tekhn. nauk; MIKHAYLOV-MIKHEYEV, P.B., red.; FREGER, D.P., red.izd-va; BELOGUROVA, I.A., tekhn. red.

[Progressive methods of heat treatment for heat-resistant alloys high in addition elements] Progressivnye metody termicheskoi obrabotki vysokolegirovannykh zharoprochnykh splavov. Leningrad, 1963. 30 p. (Leningradskii dom nauchno-tekhnicheskoi propagandy. Obmen peredovym opytom. Seriia: Metallovedenie i termicheskaia obrabotka, no.4)
(Heat-resistant alloys--Heat treatment) (MIRA 16:10)

MIKHAYLOV-MIKULINSKIY, M. S.

Cand. Technical Sci.
Docent, Moscow Energetics Inst. im. V. M. Molotov, -c1946-49-.
"New Mechanical Brake for Testing Motors," Elektrichest. No. 4, 1948;
"The Problem of the Demagnetization Effect of Lateral Armature Reactance in Direct- Current Machines," Vest. Elektr-Prom., No. 1, 1948;
"Commutation Current Reaction on the Main Field of Direct Current Machines," ibid., No. 7, 1949.

MIKHAYLOV-MIKULINSKIY, DOCENT M. S. PA 69T29

USSR/Electricity Apr 1948
Motors, Electric
Brakes

"New Mechanical Brake for Testing Motors," Docent M. S. Mikhaylov-Mikulinskiy, Cand Tech Sci, 2½ pp

"Elektrichest" No 4

Describes new system of dynamometers and brakes suggested to replace old system for testing motors. Describes hydrostatic dynamometer, and use of dynamometer for testing electrical motors.

69T29

USSR/Electricity Jul 49
Electrical Equipment
Direct Current

PA 64/49T31

"Commutation Current Reaction on the Main Field of Direct Current Machines," Docent M. S. Mikhaylov-Mikulinskiy, Cand Tech Sci, Moscow Power Inst imeni V. M. Molotov, 4½ pp

"Vest Elektro-Prom" No 7

Points out inadequacies of usual formula for calculating computator current reaction: does not take into account speed, nature of commutation, and number of commutating sections. Analyzes typical case of linear delayed and accelerated

[redacted] 64/49T31

USSR/Electricity (Contd) Jul 49

commutation for various windings. Calculates magnetomotive force of the supplementary commutation currents and indicates its variation as current and speed change.

[redacted] 64/49T31

MIKHAYLOV-MIKULINSKIY, M. S.

MIKHAYLOV-MIKULINSKIY, M. S., Docent

USSR/Electricity - Generators, Pulse Nov 51

"Electromagnetic Generators of Periodic Power-Frequency Pulses," Docent M. S. Mikhaylov-Mikulinskiy, Cand Tech Sci, Moscow Power Eng Inst imeni Molotov

"Elektrichestvo" No 11, pp 18-21

Shows that periodic pulses of various frequencies, form, length, etc., can be generated by elec machines which are simple in design and reliable in operation. Describes 2 types of electromagnetic pulse generators, i.e.,

201T57

USSR/Electricity - Generators, Pulse (Contd) Nov 51

unipolar and bipolar machines. Author was awarded Certificate of Authorship No 81725 for the 1st type, and he and Ye. V. Nitusov were awarded Certificate of Authorship No 48923 for the 2d type. Submitted 11 Apr 51.

201T57

KARASEV, Mikhail Fedorovich, professor; MIKHAYLOV-MIKULINSKIY, M.S., redaktor; VORONIN, K.P., tekhnicheskiy redaktor.

[Commutation of direct current machines] Kommutatsiia mashin postoiannogo toka. Moskva, Gos. energ.izd-vo, 1955. 142 p. (MLRA 8:6)
(Commutation (Electricity))

88151
S/110/60/000/002/005/005
E073/E455

9.6000 (3702, 1067, 1089)

AUTHORS: Mikhaylov-Mikulinskiy, M.S., Candidate of Technical Sciences and Alekseyev-Mokhov, S.N., Engineer

TITLE: Bi-Rotating Meter for Measuring the Slip of Asynchronous Motors

PERIODICAL: Vestnik elektropromyshlennosti, 1960, No.2, pp.77-78

TEXT: The authors developed at MEI a new instrument (Author's Certificate No.121185 of 1959) for measuring the slip of asynchronous motors. A sketch of it is shown in Fig.1. It consists of a bi-rotative synchronous motor, i.e. a motor whose rotor and stator can both rotate. The rotor is driven by reduction gearing; the stator drives a tachometer. The spindle 1 with a rubber tip is connected via the reduction gearing 2 to the shaft of the rotor which will be referred to as the internal rotor. The stator will be referred to in the following as the external rotor and is connected by means of toothed gears with the shaft of the tachometer. With the synchronous motor switched on, the spindle tip of the instrument is pressed onto the shaft of the asynchronous motor whose slip is

88151
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E073/E455

Bi-Rotating Meter for Measuring the Slip of Asynchronous Motors

to be measured. The pointer of the tachometer indicates the slip in percent. The principle of operation is as follows: the synchronous motor has as many poles as the asynchronous motor to be tested and rotates with a speed n_1 (both motors are fed from the same supply system). The external rotor of the bi-rotative motor is so connected to the supply system that its field rotates in the direction of rotation of the asynchronous motor, and the internal rotor is coupled to the rotor of the motor under test. Thus, the external rotor will rotate with the speed $n_1 - n$, due to the synchronous rotation of the field and of the internal rotor. The external rotor being coupled to the tachometer, $n_1 - n$ will be measured, the accuracy depending on the tachometer. It is obvious that thus the slip will be measured more accurately than if the total rpm are measured. The instrument is suitable for indicating slips between 0.5 and 200%. In the case of 100% slip, the motor under test, and consequently also the spindle of the instrument, will be static. Since the slip is inversely proportional to the speed n_1 and the frequency, the measured slip

88151
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E073/E455

Bi-Rotating Meter for Measuring the Slip of Asynchronous Motors

has to be divided by the instrument reading obtained when the spindle is braked. As a consequence, the instrument introduces the necessary frequency correction (the spindle of this instrument can be easily braked by hand). As a result of this feature, the instrument can also be used as a supply-frequency meter within a wide range of frequencies. Furthermore, it is suitable for continuous testing of tachometers. As it is available at present, the instrument is fully suitable for industrial use. If necessary, a single instrument can be used for the frequency ranges 50 to 150 and 200 to 500 cps; at the latter frequencies, the instrument is particularly useful since the slip cannot be measured satisfactorily by stroboscopic methods or by induction, even for very small slip planes. Tests of the instrument at the works Vladimir Il'ich, KhELZ, KEMZ and "Krasnyy metallist" showed that it will be very useful in test-stands and laboratories. There are 2 figures.

SUBMITTED: July 24, 1959

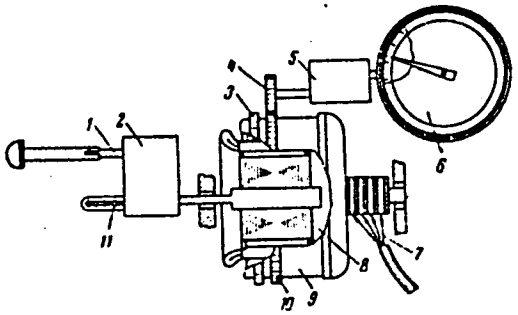
Card 3/4

88151
S/110/60/000/002/005/005
E073/E455

Bi-Rotating Meter for Measuring the Slip of Asynchronous Motors

Fig.1. Sketch of the Instrument

1 - Spindle with rubber tip
2 - reduction gearing
3 - additional scale
4 - transmission gear
5 - reduction gearing to the tachometer used as a range switch
6 - scale of the tachometer graduated in percent of slip
7 - current supply
8 - internal rotor
9 - external rotor
10 - gear fitted on the external rotor
11 - switch for changing the number of poles.



Card 4/4

MIKHAYLOV-MIKULINSKIY, Mikhail Semoylovich, kand.tekhn.nauk, dotsent

Fundamental magnetic losses in electric machines with two rotating fields. Izv. vys. ucheb. zav; elektromekh. 3 no.8:77-83 '60. (MIRA 13:9)

1. Moskovskiy energeticheskiy institut.
(Frequency changers) (Electric machinery)

KARASEV, Mikhail Fedorovich; MIKHAYLOV-MIKULINSKIY, M.S., red.; BORUNOV, N.I., tekhn. red.

[Commutation in collector-type d.c. machinery] Kommutatsiia kollektivnykh mashin postoiannogo toka. Moskva, Gos. energ. izd-vo 1961. 223 p. (MIRA 14:10)
(Electric machinery--Direct current)

MIKHAYLOV-MIKULINSKIY, Mikhail Samoylovich, kand.tekhn.nauk, dotsent

Magnetic stress forces in electrical machines with two rotating magnetic fields. Izv. vys. uch. zav.; elektromekh. 5 no.8: 382-392 '62. (MIRA 15:8)

1. Kafedra elektricheskikh mashin Moskovskogo energeticheskogo instituta.
(Electric machinery) (Magnetic fields)

MIKHAYLOV-MIKULINSKIY, Mikhail Samoylovich, kand.tekhn.nauk, dotsent

Calculation of the magnetic circuits of electrical machines with two rotating fields. Izv.vys.ucheb.zav.; elektromekh. 5 no.10:1115-1131 '62. (MIRA 15:11)

1. Moskovskiy energeticheskiy institut.
(Magnetic circuits) (Electric machinery)
(Electric current converters)

MIKHAYLOV-MIKULINSKIY, M.S., kand. tekhn. nauk, dots.;
ALEKSEYEV-MOKHOV, S.N., assistent

Calculation of the magnetic circuit of a synchronous machine.
Trudy MEI no.39:65-68 '62. (MIRA 17:6)

MIKHAYLOV-MIKULINSKIY, Mikhail Samoylovich, kand.tekhn.nauk, dotsent

Comments on V.V.Fetisov's article "Calculation of the inductance of the armature circuit of a noncompensated d.c. machine taking into account the saturation of the toothed zone." Izv.vys.ucheb. zav.; elektromekh. 7 no.11:1393 '64. (MIRA 18:3)

1. Moskovskiy energeticheskiy institut.

L 1259-66 EPA(s)-2/EWT(1)

ACCESSION NR: AP5024375 UR/0286/65/000/015/0052/0052
621.313.333

36
B

AUTHOR: Mikhaylov-Mikulinskiy, M. S.; Alekseyev-Mokhov, S. N.
44,55 44,55

TITLE: A motor with a rolling rotor. Class 21, No. 173308

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 15, 1965, 52

TOPIC TAGS: electric motor, electric rotating equipment
21,44,55

ABSTRACT: This Author's Certificate introduces: 1. A motor with a rolling rotor and two three-phase windings on the stator. Both these windings have the same number of pole pairs which are fed from a common circuit or from circuits with equal frequencies. The operational reliability of the motor is improved by mounting wheels on both ends of the rotor shaft which roll on bearing rings fastened into the stator frame. 2. A modification of this motor designed for synchronous speed. The wheels on the ends of the rotor shaft have teeth which mesh with teeth in the bearing rings. Roller bearings are also fastened to the rotor shaft. These bearings are located in sockets hollowed out of the motor housing. The difference between the diameter of

Card 1/3

L 1259-66

ACCESSION NR: AP5024375

the socket and that of the outer bearing ring is the same as the difference in the design diameters of the gears.

ASSOCIATION: none

SUBMITTED: 05May61 ENCL: 01 SUB CODE: EE

NO REF SOV: 000 OTHER: 000

Card 2/3

L 1259-66

ACCESSION NR: AP5024375

ENCLOSURE: 01

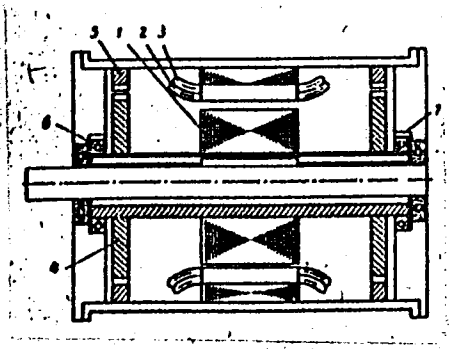
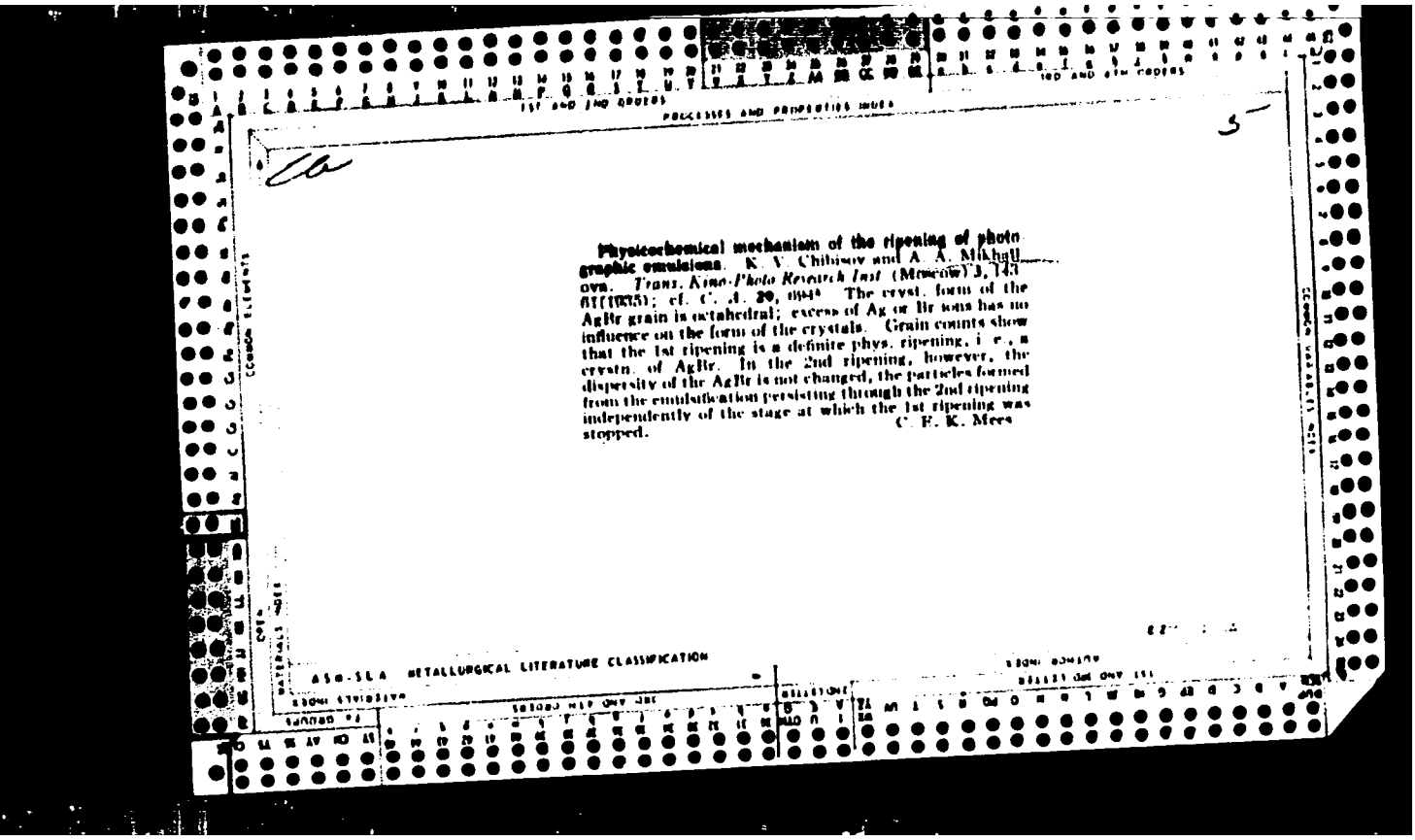
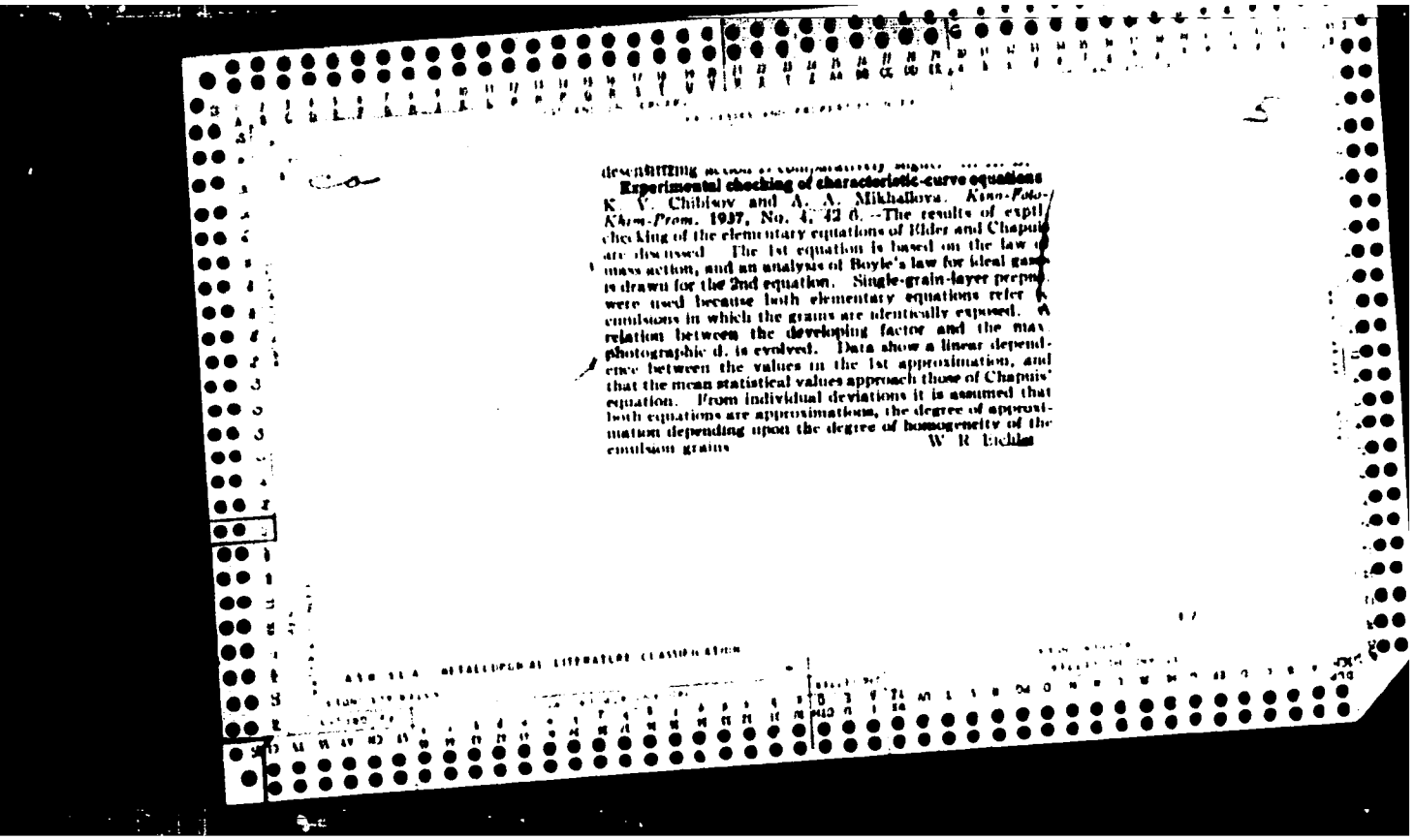


Fig. 1. 1--rotor; 2 and 3--three-phase windings on the stator; 4--wheels; 5--bearing rings; 6--roller bearing; 7--socket

Card 3/3



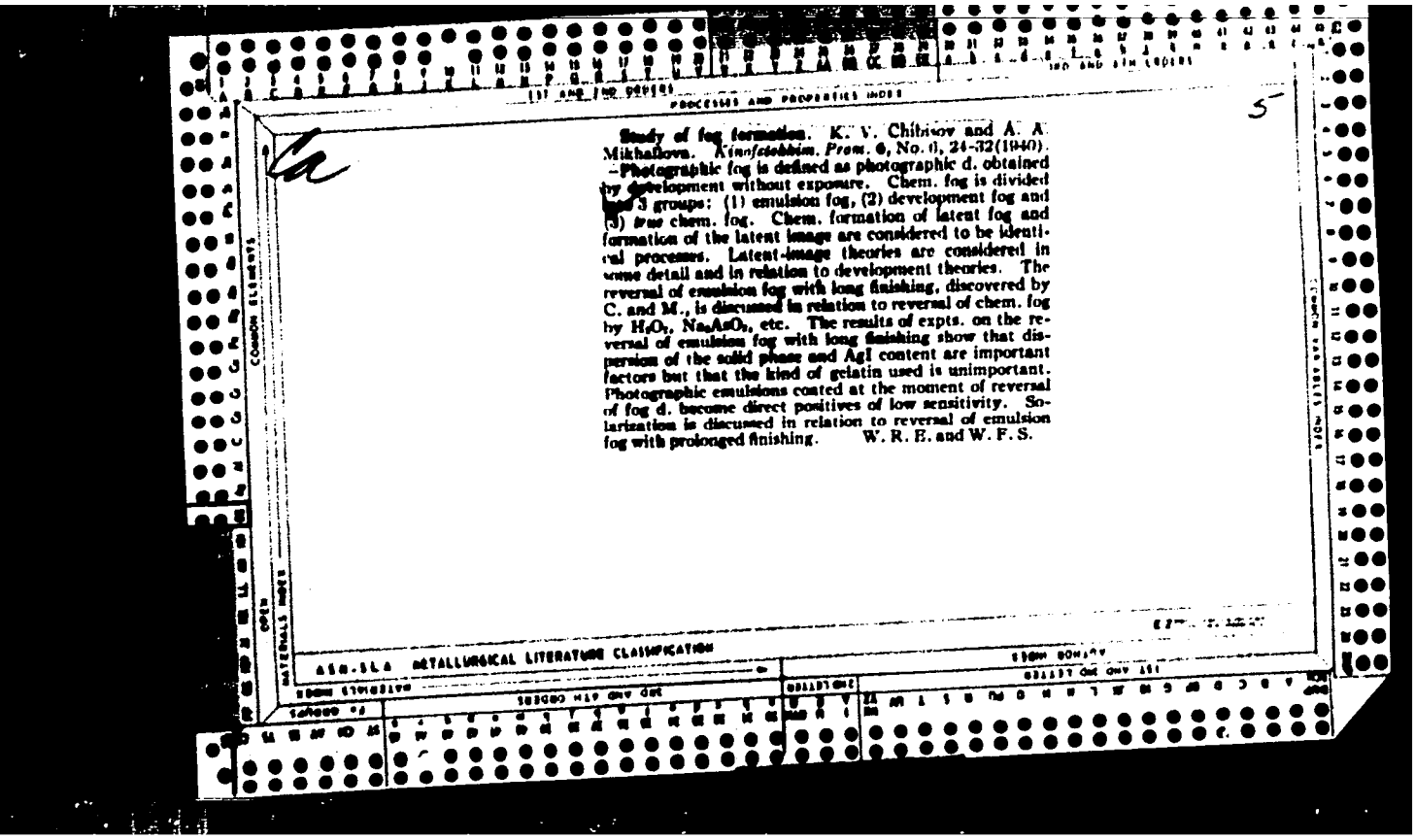
Physicochemical mechanism of the ripening of photographic emulsions. K. V. Chibisov and A. A. Mikhailova. *Trans. Kino-Photo Research Inst.* (Moscow) 3, 143 (1935); cf. *C. A.* **29**, 6944. The cryst. form of the AgBr grain is octahedral; excess of Ag or Br ions has no influence on the form of the crystals. Grain counts show that the 1st ripening is a definite phys. ripening, i. e., a cryst. of AgBr. In the 2nd ripening, however, the dispersity of the AgBr is not changed, the particles formed from the emulsification persisting through the 2nd ripening independently of the stage at which the 1st ripening was stopped.
C. F. K. Mees



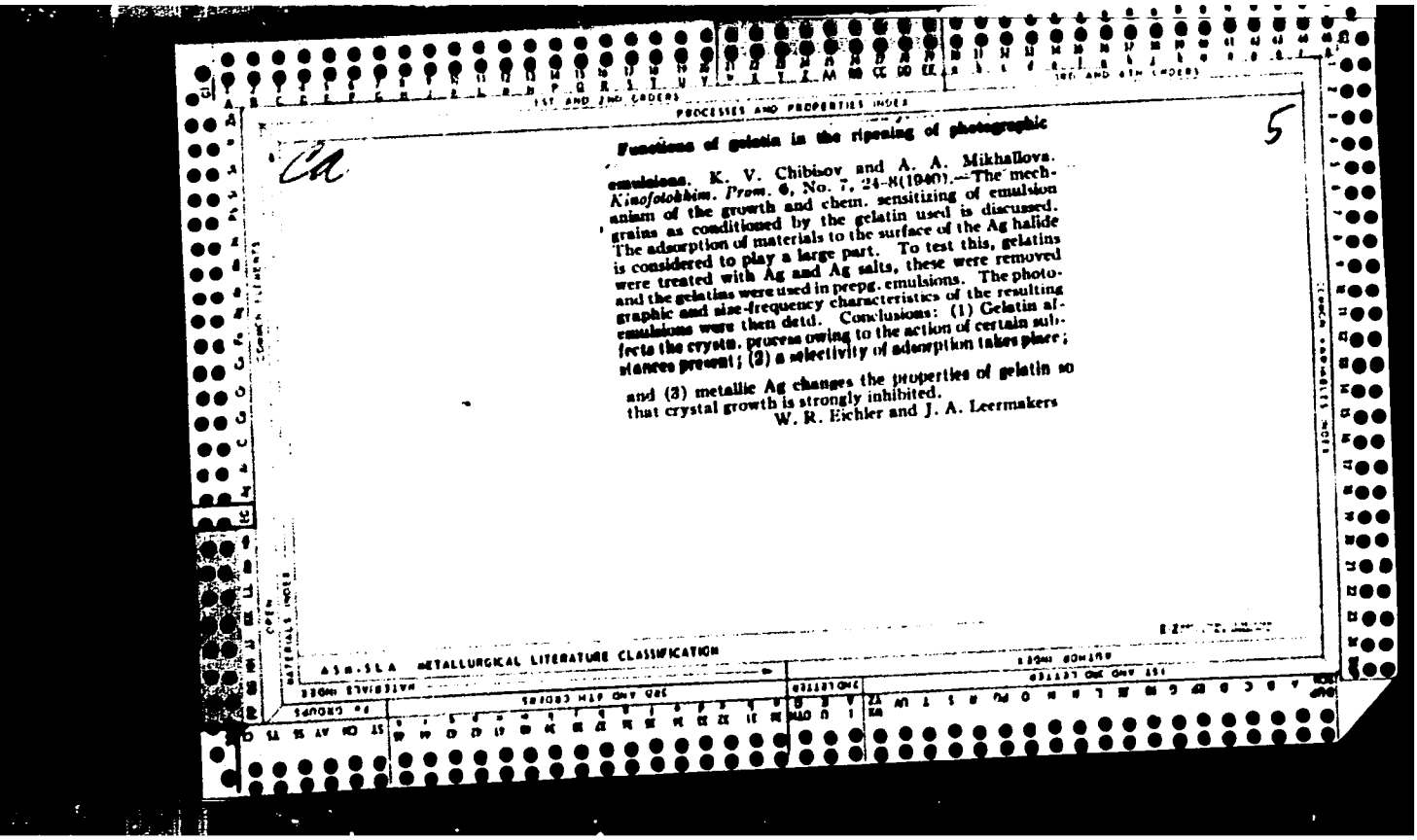
Experimental checking of characteristic-curve equations

K. V. Chibisov and A. A. Mikhailova. *Kino-Foto-Khim-Prom.* 1937, No. 4, 42 6.--The results of expti checking of the elementary equations of Hider and Chapuis are discussed. The 1st equation is based on the law o mass action, and an analysis of Boyle's law for ideal gas is drawn for the 2nd equation. Single-grain-layer prepa were used because both elementary equations refer t emulsions in which the grains are identically exposed. A relation between the developing factor and the max photographic d. is evolved. Data show a linear depend- ence between the values in the 1st approximation, and that the mean statistical values approach those of Chapuis' equation. From individual deviations it is assumed that both equations are approximations, the degree of approxi- mation depending upon the degree of homogeneity of the emulsion grains

W R Bichlas



Study of fog formation. K. V. Chibisov and A. A. Mikhailova. *Kinofotokhim. Prom.* 6, No. 1, 24-32(1940). —Photographic fog is defined as photographic d. obtained by development without exposure. Chem. fog is divided into 3 groups: (1) emulsion fog, (2) development fog and (3) true chem. fog. Chem. formation of latent fog and formation of the latent image are considered to be identical processes. Latent-image theories are considered in some detail and in relation to development theories. The reversal of emulsion fog with long finishing, discovered by C. and M., is discussed in relation to reversal of chem. fog by H_2O_2, Na_3AsO_3, etc. The results of expts. on the reversal of emulsion fog with long finishing show that dispersion of the solid phase and AgI content are important factors but that the kind of gelatin used is unimportant. Photographic emulsions coated at the moment of reversal of fog d. become direct positives of low sensitivity. Solarization is discussed in relation to reversal of emulsion fog with prolonged finishing. W. R. E. and W. F. S.



PROCESSES AND PROPERTIES INDEX

5

Functions of gelatin in the ripening of photographic emulsions. K. V. Chibisov and A. A. Mikhallova. *Kinofotokhim. Prom.* 6, No. 7, 24-8(1940).—The mechanism of the growth and chem. sensitizing of emulsion grains as conditioned by the gelatin used is discussed. The adsorption of materials to the surface of the Ag halide is considered to play a large part. To test this, gelatins were treated with Ag and Ag salts, these were removed and the gelatins were used in prepg. emulsions. The photographic and size-frequency characteristics of the resulting emulsions were then detd. Conclusions: (1) Gelatin affects the crystn. process owing to the action of certain substances present; (2) a selectivity of adsorption takes place; and (3) metallic Ag changes the properties of gelatin so that crystal growth is strongly inhibited.

W. R. Eichler and J. A. Leermakers

METALLURGICAL LITERATURE CLASSIFICATION

MIKHAYLOVA, A. A.

"New Data on the Nature of Photographic Sensitivity," Dokl. AN SSSR, 54, No.8, 1946

MIKHAYLOVA, A. A. Cand. Chem. Sci.

Dissertation: "Microanalytical Investigation of Microchemical Reactions During the Ageing of Photographic Emulsion." Moscow Order of Lenin State U imeni M. V. Lomonosov, 23 Apr 47.

SO: Vechernyaya Moskva, Apr, 1947 (Project #17836)

MIKHAYLOVA, A. A.

K. V. CHIBISOV, A. A. TITOV and A. A. MIKHAILOVA

"Effect of the Topography of Sensitivity Centers upon the Photographic Properties of an Emulsion (Communication 101), Trans Kino-Foto Scientific Research Institute USSR, No. 8, 105-114, 1947 (Printed in 1948).

These are experienced workers, but their results must be regarded with caution since it has not been demonstrated in our laboratores that their analytical methods are accurate.

IX

MIKHAYLOVA, A. A.

"The Nature of Photosensitivity and the Mechanism of the Processes Taking Place in the Synthesis of Photographic Emulsions," Trudy NIKFI, 1948

MIKHAYLOVA, A.A.; GNIBISOV, K.V.

Methods of microchemical analysis of the solid phase of a photographic emulsion. Trudy NIKFI no.8:54-74 '48. (MIRA 11:5)
(Photographic emulsions)

CHIBISOV, K.V.; MIKHAYLOVA, A.A.

Topochemical transformations during the ripening of photographic emulsions. Trudy NIKFI no.8:75-94 '48. (MIRA 11:5)
(Photographic emulsions)

CHIBISOV, K.V.; TITOV, A.A.; MIKHAYLOVA, A.A.

Influence of the topography of centers of sensitivity on the photographic properties of an emulsion. Trudy NIKFI no.8:105-114 '48.
(Photographic emulsions) (MIRA 11:5)

MIKHAYLOVA, A. A.

"Research on the Mechanism of Ripening of Photographic Emulsions. I. The 'Second' Ripening (The Role of Gelatin, the Effect of Temperature and of the Concentration of Bromine Ions)," Zhur. Fiz. Khim., 23, No.12, 1949

[redacted]

21568 MIKHAYLOVA, A. A.

Stroyeniye i vozniknoveniye dentina u amfibiy.
Doklady Akad. nauk SSSR, Novaya Seriya, t. LXVII, No. 2, 1949, s. 369 - 71.

SO: Letopis' Zhurnal'nykh Statey, No. 29, Moskva, 1949.

5

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Kinetics of ripening of photographic emulsions and the chemical nature of the sensitivity centers A. A. Titov and A. A. Mikhailova *Doklady Akad. Nauk S.S.S.R.* 70, 451-6(1950). Doubt is cast on the reproducibility of emulsions prepd. from solns. of ammoniacal $AgNO_3$. The difficulty can be overcome by starting with cryst. Ag ammonium nitrate. In the expts. 3 gelatins were used, one which supplied no S to the emulsion, a second which contributed 10^{-9} g. equiv. of Ag_2S, and a third producing considerable quantities of Ag_2S. The results confirmed that sensitivity centers consist of Ag or Ag_2S, the predominance of one or the other depending on the conditions of their formation. Fog nuclei always form from metallic Ag specks. Authors

CHIBISOV, K. V.; TITOV, A. A .; MIKHAYLOVA, A. A.

Photochemistry

Nature of the centers of photo-sensitivity and the part played by gelatin in their formation. Usp. nanch. fot., No. 1, 1951.

9. Monthly List of Russian Accessions, Library of Congress, June 1952, Uncl.

USSR.

The effect of sulfur compounds on the kinetics of the chemical ripening of photographic emulsions. K. V. Chibisov, A. A. Titov, and G. A. Mikhailova. *Doklady Akad. Nauk S.S.S.R.* 78, 319–22(1951); cf. *C.A.* 44, 2877*b*, 8805*a*; 45, 1443*g*.—To det. the effect of S compds. on the secondary aging of emulsions, the influence of thiosinamine and $Na_2S_2O_3$ on the sensitizing action was studied. The results indicate that in the aging process no Ag_2S is formed in the emulsion. The S compds. formed on the surface of the AgBr under the influence of the S-bearing components of the gelatin have no sensitizing effect. These compds. only increase the rate of chem. aging in so much as they increase the rate of the reduction process—the autocatalytic process of formation of Ag centers of photosensitivity. J. Rovtar Leach

Chemical Abst.
Vol. 48 No. 9
May, 19, 1954
Photography

Kinetics of chemical ripening of photographic emulsions and the role of sulfur compounds. S. V. Chibisov, A. A. Titov, and A. A. Mikhailova. *Doklady Akad. Nauk S.S.S.R.* 84, 547-50(1952); cf. *C.A.* 45, 1443g.—It is assumed that the 2nd ripening process is a reduction process which can be accelerated by S compds., but the S compds. do not influence the max. light sensitivity of the emulsion. This is in contrast to Sheppard's theory about Ag_2S specks as centers of light sensitivity. When N_2H_4 (0.002 g. $N_2H_4.H_2SO_4$ to 1 g. AgBr) was added at the beginning of the 2nd ripening, the results obtained were similar to those obtained when S compds. such as $Na_2S_2O_3$ or Na_2S were added. Chem. ripening was accelerated by N_2H_4, but color sensitivity was not affected. With both N_2H_4 and S compds. the formation of adsorption compds. on the emulsion microcrystals leads to acceleration of the reduction process. The polar N_2H_4 mol. is adsorbed, and this loosens the Ag bonds. The N_2H_4 reduces AgBr on the surface of the microcrystals, and these Ag specks are the centers of light sensitivity. The N_2H_4 and the S compds. caused different effects of acceleration with different gelatins, but the degree of acceleration was parallel. E. M.

3/30/54

MIKHAYLOVA, A.A.

6

Mechanism of ripening of photographic emulsions. II. Relation between the processes of change of light-sensitivity, growth of fog, and formation of silver during ripening. A. A. Mikhailova, I. M. Ratner, A. A. Titov, and K. V. Chibisova (All-Union Cine-Photo Inst., Moscow). *Zhur. Fiz. Khim.* 27, 866–77(1953); cf. *C.A.* 44, 2877*b*, 46, 6018*e*.—The light-sensitivity (*S*) and fog d. (*D*) were measured of several photographic emulsions, each at various stages of secondary ripening; the amt. of metallic Ag (*c*) in each sample was detd. by fixation of the unexposed emulsion at 10° followed by soln. of the residual Ag in HNO_3 and potentiometric titration. Data on *S*, *D*, and *c* are presented graphically for emulsions of AgBr (I), ripened with and without NH_4, I with 3, 5, and 7.5 mole % AgI, ripened with NH_4, and I with 1 and 3 × 10^{-4} g. thiosinamine/g. of gelatin, ripened with NH_4. Other graphs show the effects of variation of bromide concn., temp. of secondary ripening, and the amt. of pre-exposure (from 0 to 2.4 × 10^5 lux-sec. during first ripening). The temp. dependence (*e*) of the rate of growth of *S* and *D*, expressed as the gradient of the linear curve of *R* ln *t* plotted as a function of $1/\theta$, where *t* is the time required for *S*, *D*, or *c* to reach a given value and θ is the abs. temp., is the same for *S* and *D* in any given emulsion; the *e* of *c* may be the same or different. On the basis of expt. data the following law is proposed: the max. sensitivity always coincides with the beginning of sharp increase of fog and with the end of the induction period for the formation of free Ag. J. W. Loweberg, Jr.

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MIKHAYLOVA, A. A. 261T14

USSR/Chemistry - Photography Jan 53

"The Oneness of the Nature of Sensitization and Desensitization of Photographic Emulsions," K.V. Chibisov, Corr Memb, Acad Sci USSR; A.A. Mikhaylova and B.G. Varshaver, All-Union Sci-Res Inst of Photography

DAN, Vol 88, No 3, pp 519-522

Action of desensitizers on chem development in the emulsion was studied and their action compared with that when accompanied by anti-filming agents. Pinacryptol green served as

261T14

the desensitizer and benzotriazol as the antifilming agent. The benzotriazol slows the process considerably but does not lower the sensitivity max. The results indicate the same mechanism exists for both processes.

MIKHAYLOVA, A.A.; CHIBISOV, I.K.

Various forms of desensitization. Usp.nauch.fot.no.4:144-149 '55. (Photographic emulsions) (MLRA 9:4)

MIKHAYLOVA, A. A., BRAUN, Y. L. and CHIBISOV, K. V.

"On the Importance of Labile Sulphur Compounds in the Photographic Emulsion," a paper given at the International Conference on Scientific Photography, Cologne, 24-27 Sep 1956.

E-3072367

and E-3068138

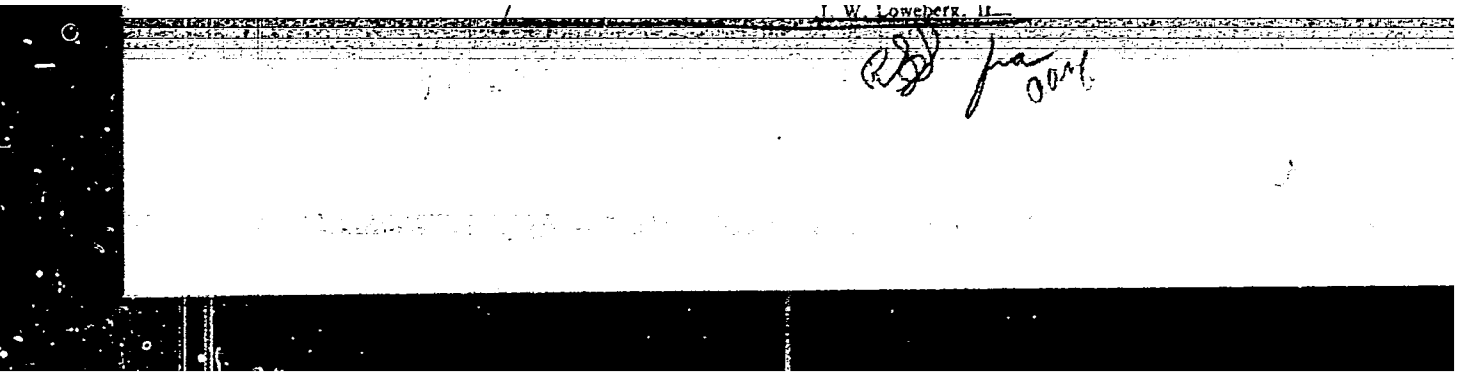
MIKHAYLOVA, A. A.

27

Functions of compounds with labile sulfur in the photographic emulsion. A. A. Mikhailova, Zh. I. Brou[illegible], K. V. Chibisov (I. I. Mechnikov State Univ., [illegible]). *Trudy Nauch. i Prikład. Fot. i Kinematografii* [illegible] (1956); cf. Kirillov and Ch., *ibid.* 28 — In order to [illegible] the role of S compds. in photographic emulsions [illegible], Lipp-mann e. prepd. from AgBr were treated with allylthiourea (I), allylbenzylthiourea (II), and diphenylthiourea (III),

[redacted]

[redacted] I-V, resp., and formation of insol. deposits near them [redacted]



AUTHORS: Karpova, A. L., Mikhaylova, A. A., SOV/2o-121-1-37/55
Chibisov, K. V., Corresponding Member, Academy of Sciences, USSR

TITLE: On the Photographic Activity of Gelatin (O fotograficheskoy aktivnosti zhelatiny)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol. 121, Nr 1, pp. 133 - 135 (USSR)

ABSTRACT: The authors tried to remove the admixtures from gelatin by means of adsorbers and to separate them by means of an electrodialysis with the aim to investigate the influence of these admixtures on the chemical "ripening". Various adsorbers exhibit a selective action and only some resins with ion exchange were suited for a practically complete removal of all active admixtures. By this the different gelatin samples were given the same properties and turned into slowly acting gelatin. Also electrodialysis removes the active admixtures and renders gelatin inert. If a five-chamber device is applied the admixtures can be separated in the form of an anodic and a cathodic fraction by electrodialysis. The substances of the cathode fraction do not directly interact with the silver ions. The compounds with unstable sulfur, the reducing agents,

Card 1/3

and the complex forming substances of the first kind, however, turn into the anode fraction. According to photographic investigations, the solution of the cathode fraction slows the ripening down while the anode fraction accelerates it. The photographic effect of the gelatin during ripening is realized by its two components: The macro-component, i.e. the albumins of the gelatin, exhibits a protective effect and acts reducingly; the micro-components control the velocity of the chemical ripening. There are 3 figures, 2 tables, and 3 references, which are Soviet.

ASSOCIATION: Vsesoyuznyy nauchno-issledovatel'skiy kinofotoinstitut (All-Union Scientific Research Institute of Photography and Cinematography)

SUBMITTED: March 18, 1958

23(SOV/77-4-3-4/16

AUTHORS: Karpova, A.L., Mikhaylova, A.A., Chibisov, K.V.

TITLE: On the Photographic Activity of Gelatine
II. An Increase in the Kinetic Activity of Gelatine

PERIODICAL: Zhurnal nauchnoy i prikladnoy fotografii i kinematografii, 1959, Vol 4, Nr 3, pp 183-192 (USSR)

ABSTRACT: This is a study of the effect of sodium thiosulfate on the second ripening process of gelatine solutions, shown on the example of three different gelatine components. On the basis of experimentally obtained data, the authors deduced a general equation, expressing with it the dependence of the rate of second ripening on the quantity of natural and added accelerators. Parallel to these experiments, the authors studied the effect of other sulfurous sensitizers and also of bromine (silver) ion concentration. Different quantitites of sodium thiosulfate and the solid phase separated from the colloid of the first ripening pro-

On the Photographic Activity of Gelatine. II. An Increase in the Kinetic Activity of Gelatine

cess were added to solutions of gelatine with different activity coefficients. The solid phase contained 3 mol. % AgJ in addition to AgBr. The authors started from the assumption that in the stage of chemical ripening sodium thiosulfate acts only as a complex-forming substance, causing acceleration of chemical ripening. The added quantity A', therefore, was added to the quantity A of natural accelerators in the gelatine. These data, in connection with the quantity B of natural retarders, served as the basis for the calculation of the activity coefficient ($K = \frac{A + A'}{B}$).

Table 1 demonstrates the results obtained. It contains in addition the values τ (time required to reach the maximum light sensitivity) and τ_0 ($\tau_0 = k\tau$). The values τ were calculated with the aid of the curves of change in light sensitivity for each concentration of

On the Photographic Activity of Gelatine. II. An Increase in the Kinetic Activity of Gelatine

$Na_2S_2O_3$ introduced into the emulsion. This calculation was carried out to demonstrate the subordination of the values to the already found [reference 2] linear dependence between the activity coefficient and the rate of chemical ripening and, consequently, to confirm the assumed role of $Na_2S_2O_3$ in this process. The results confirm this assumption, showing that $Na_2S_2O_3$ behaves like those natural complex-forming components, which have most affinity to the silver ions. The obtained values are characterized by two prominent features: 1) A strict dependence of τ_0 on the conditions of emulsion synthesis, and 2) fluctuations of the individual values of this magnitude within parallel experiments. This shows that τ_0 (time required to reach the maximum

On the Photographic Activity of Gelatine. II. An Increase in the Kinetic Activity of Gelatine

light sensitivity, if k=1) is a very sensitive magnitude indicative of the observation of constancy of the established synthesis conditions. On the basis of their experiments, which confirmed the role of $Na_2S_2O_3$ as accelerator during the ripening process, the authors enlarged the previously obtained formula $\tau_o = \frac{A}{B}\tau$ by adding A' to the numerator of the activity coefficient. The equation (in its final form: A' τ_o B $\frac{1}{\tau}$ - A), on the basis of the dependency $\left/\frac{1}{\tau}\right.$, A'$\left/\tau\right.$ (see graph 1, which represents this dependency for the three series of experiments in table 1), makes it possible to determine the content of accelerators and retarders in gelatine. In order to clarify the role of sodium thiosulfate, the authors

On the Photographic Activity of Gelatine. II. An Increase in the Kinetic Activity of Gelatine

considered it suitable to compare its effect on chemical ripening with the effect of other compounds with an unstable sulphur component. A study of the effect of thiourea, sodium tetrathionate and trithionate and potassium rodanide revealed that, with the exception of thiourea, these compounds are not subject to the general equation (graphs 2-4). They showed a retarding effect on the ripening process. Finally, the authors studied the effect of pAg (pBr) on the kinetics of chemical ripening. Graph 5 shows curves (based on previously described experimental data), which represent the dependence of the rate of ripening on pAg for bromine and bromo-iodine emulsions. The curves (table 4) show the complicated character of this dependency. A further factor is the instability of the maximum light sensitivity (section 2 of graph 5), which can be reached at various values

On the Photographic Activity of Gelatine. II. An Increase in the Kinetic Activity of Gelatine

of pAg. Optimum pAg can be assumed in the case, when the maximum light sensitivity has been reached. The strong effect of the nature of the gelatine component on this phenomenon however has to be taken into consideration. This factor also plays a role in the dependence of the change of maximum sensitivity on pAg. The last section is a theoretical generalization of the results. Table 4 is a synopsis of the effects exercised by the various substances on the rate of ripening, the maximum of light sensitivity and the fog phenomenon. The latter is considered in connection with the maxima of light sensitivity. The authors mention the Soviet scientist V.A.Bekunov [reference 7], who proved the linear dependence (pAg, $\frac{1}{\tau}$). There

Card 6/7 are 5 tables, 5 graphs and 8 references, 6 of which are

SOV/77-4-3-4/16

On the Photographic Activity of Gelatine. II. An Increase in the Kinetic Activity of Gelatine

Soviet and 2 English.

ASSOCIATION: Vsesoyuznyy nauchno-issledovatel'skiy kinofotoinstitut (NIKFI) (All-Union Scientific Research Institute for Motion Pictures and Photography (NIKFI))

SUBMITTED: 22 August, 1957

Card 7/7

MIKHAYLOVA, A.A.

Erythrocyte gelatin test in the diagnosis of immune hemolytic anemias. Probl. gemat. i perel. krovi 9 no.10:49-51 O '64.
(MIRA 18:3)

1. Gor'kovskaya oblastnaya stantsiya perelivaniya krovi (dir. N.Ya. Klimova).

BORODKINA, M.S.; MIKHAYLOVA, A.A.; SHEBERSTOV, V.I.

Sensitivity reaction of photographic gelatins to labile sulfur.
Zhur.nauch.i prikl.fot. i kin. 10 no.3:220-221 My-Je '65.
(MIRA 18:11)

1. Vsesoyuznyy nauchno-issledovatel'skiy kinofotoinstitut.

MIKHAYLOVA, A.A.

Cystographic study of patients before and after herniotomy.
Urologiia 23 no.3:45-49 My-Je '58 (MIRA 11:6)

1. Iz kafedry obshchey khirurgii (zav. - prof. I.M. Tal'man)
Leningradskogo sanitarno-gigiyenicheskogo meditsinskogo instituta.
(BLADDER, radiography
cystography before &after herniotomy (Rus))
(HERNIA, surg.
prep. & postop. cystography (Rus))

POLIVODA, A.I.; MIKHAYLOVA, A.A.

Studying the electric constants of liver tissues in rats.
Biofizika 5 no. 5:612-616 '60. (MIRA 13:10)
(LIVER) (ELECTROPHYSIOLOGY)

POLIVODA, A.I.; MIKHAYLOVA, A.A.

Studying the electric characteristics of the rat liver in radiation injury. Radiobiologiia 1 no.2:176-181 '61. (MIRA 14:7)
(GAMMA RAYS--PHYSIOLOGICAL EFFECT)
(ELECTROPHYSIOLOGY)

MIKHAYLOVA, A.A.

Changes in the electric parameters of the liver in irradiated animals due to prophylactic administration of cysteine. Radiobiologiia 1 no.3:325-329 '61. (MIRA 14:10)
(CYSTEINE) (RADIATION PROTECTION)
(ELECTROPHYSIOLOGY)

MIKHAYLOVA, A. A.

(c)

Radical Formation by Irradiation in Living Cells

V. N. Benerolensky, A. I. Shuraviev, A. A. Mikhaylova, B. N. Tarusov and B. V. Ukonov

The amount of free radicals in organs of rats and in cells cultured *in vitro* during and after irradiation has been studied.

Radicals were determined using the method Kostov-Tarusov. Intracellular polymerisation was measured by the use of low toxicity water-soluble monomers of the polyvinyl and acrilo nitrate groups. The monomers were introduced into cells at different intervals before and after irradiation. In addition, peroxide radicals in living cells were determined for very low intensity radiations (Shuraviev). Both methods have some advantage over the paramagnetic resonance method since living cells are used.

It was shown that the radiation-induced free radicals in living cells are either oxidative or non-oxidative, and that radical formation continues after irradiation. The ratio of oxidative to non-oxidative radicals is reduced with increasing ionisation density.

The kinetics of radical formation in living cells were studied as a function of dose and time.

Scientific Association of Radiologists, Academy of Sciences of the USSR, Moscow

report presented at the 2nd Intl. Congress of Radiation Research, Harrogate/Yorkshire, Gt. Brit. 5-11 Aug 1962